

Jan. 10. 1829
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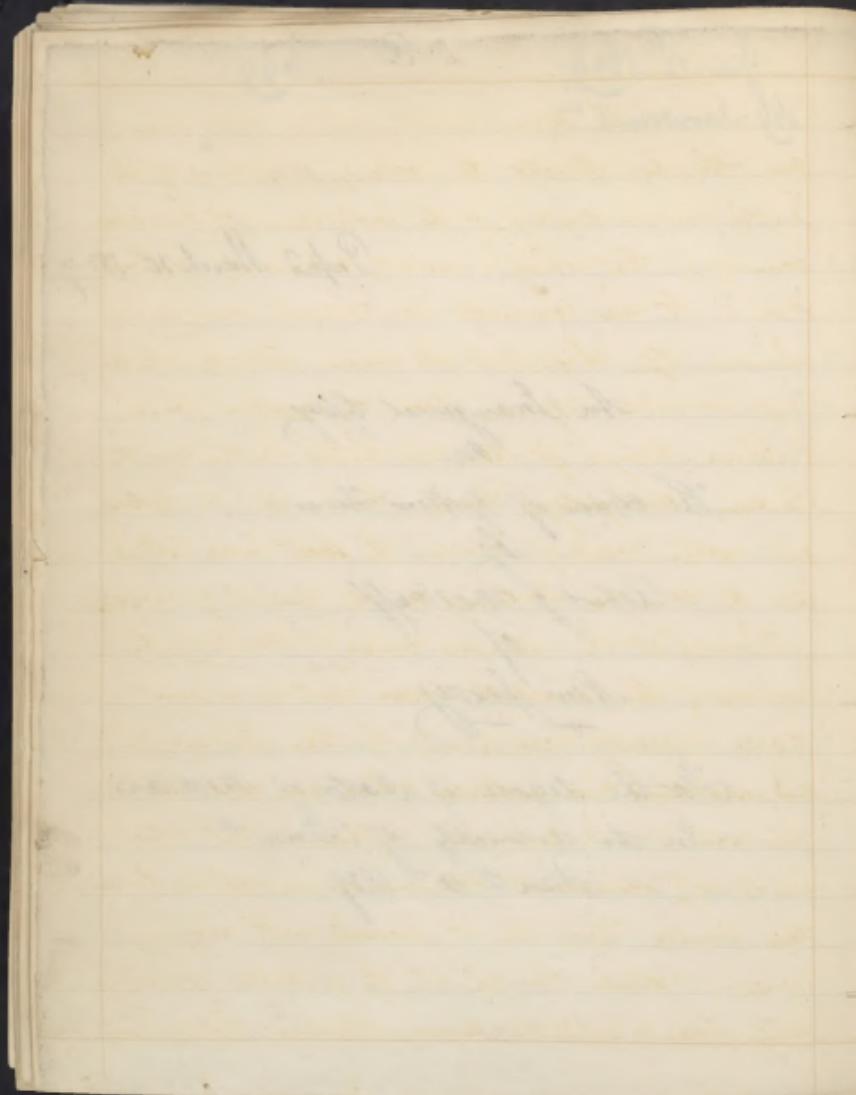
Dr. P. 1099

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Read March 10. 1829

An Inaugural Essay
on
The cause of yellow Fever
by
Robert J. Woodruff
of
New Jersey

For the degree of Doctor of Medicine
In the University of Penn^a
Jan 10th 1829



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The disease, which, perhaps more than any other, has attracted the notice of physicians, of the public, and particularly of the inhabitants of our own country, is that which is usually designated "yellow fever". It has committed very extensive ravages in human life, throughout all warm latitudes, whether inter or ultra-tropical, from the eastern frontier of China, through portion and hither India and the Indian Archipelago, Persia, Arabia, and the eastern and western coasts of Africa, the West India Islands, and the countries bordering on the Gulf of Mexico.

Throughout this extensive range of territory, the sources of this formidable disease exist in a great degree, frequently accompanied by those favourable and ascertained circumstances which are essential to their activity and destructive influence, and which are of only occasional occurrence in regions beyond these limits. There then it prevails with varying degrees of violence through all the gradations of universality from a sporadic disease attacking but a few

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individual, up to a wide spread epidemic whose track is marked by destruction and death. But the ravages of this scourge have unhappily not been confined within the boundaries which have just been mentioned. Its curse has found "a local habitation" in almost every region. Yellow Fever has, at times, prevailed with epidemic violence throughout these United States, at Copenhagen, in Holland, in the Netherlands, in Austria and Hungary in the southern cities of France, in Spain, Italy and Greece.

In all these places its existence is recorded at as distinct a period, be it remembered, as medical history extends to, appearing under precisely the same nature, manifesting the same phenomena, governed by the same laws, and prevailing under the same circumstances of situation and season as at the present day.

Of an epidemic, so extensively prevalent, and which has become interesting to us by our and frequent experience, it is of consequence that we should be acquainted with the cause, in order that those, who preside over the health, and thereby the

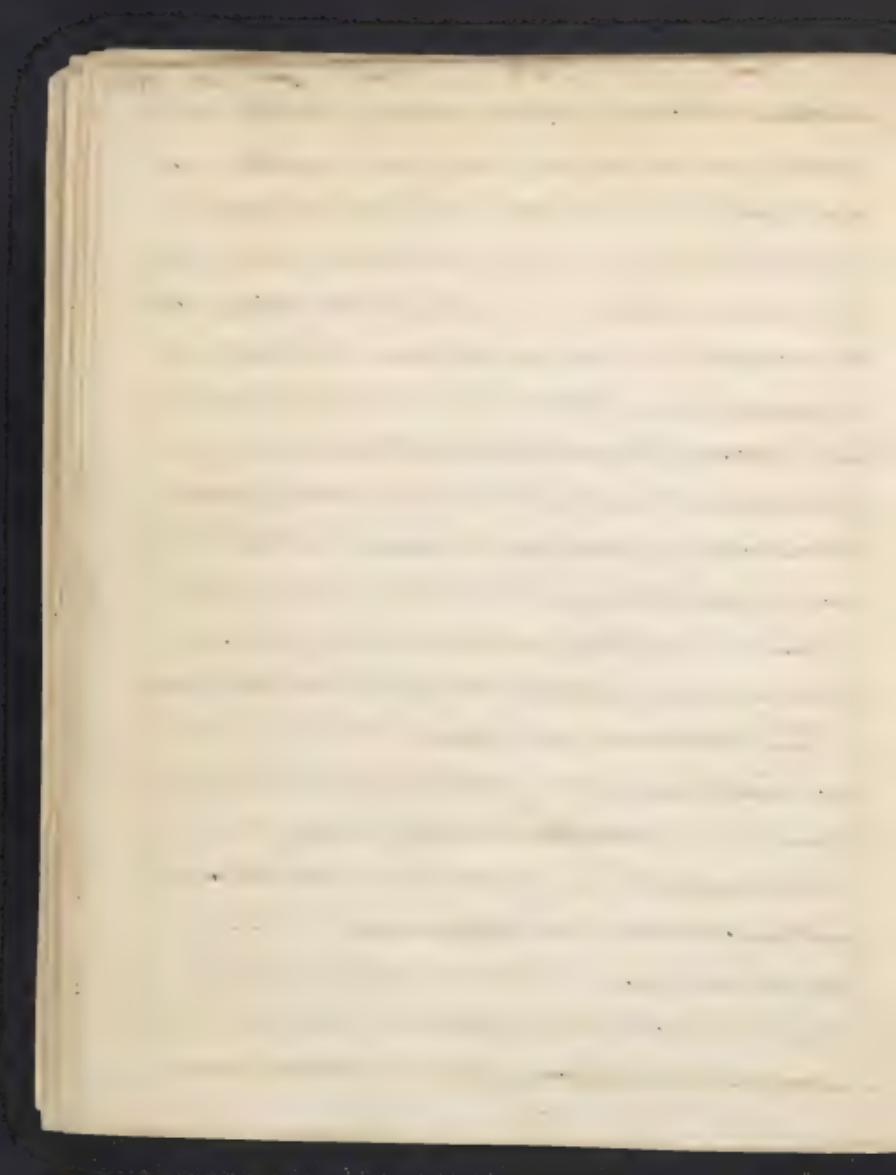
the first time occurring in an instant
of time and consisting of a series of
successive positions of the body, in
which the body is in a state of motion, and
which is called a motion. The motion of
a body is measured by the distance
it has travelled in a given time, and
the velocity of the body is the distance
it has travelled in a given time, and
the acceleration of the body is the
rate of change of velocity. The
velocity of a body is the rate of change
of its position with respect to time,
and the acceleration of a body is the
rate of change of its velocity with
respect to time. The motion of a
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body is the rate of change of its
velocity with respect to time.

happiness of their fellow men, may, if practicable, remove ³ it. This is a subject on which medical opinion has been much divided, and which has been disputed with violence and even acrimony. The two principal opinions, and those, ^{alone} which it is necessary to notice, are those which refer the origin of the disease to marsh mis-
matte and to contagion. There are some indeed who think they can reconcile the conflicting statements and creeds on this subject by asserting that the disease originates naturally from marsh mismatte, but may acquire a contagious property by such circumstances, as crowding, filth, and deficient ven-
tilation. This is obviously a gratuitous assumption, ~~that~~
~~it is impossible~~; for if the disease ever arises from one of those causes, it is certainly never pro-
duced by the other. it cannot have both a mis-
matte and a contagious origin. Though from the almost infinite number of publications on the sub-
ject of the cause of yellow fever, it is impossible that my acquaintance with it can be otherwise

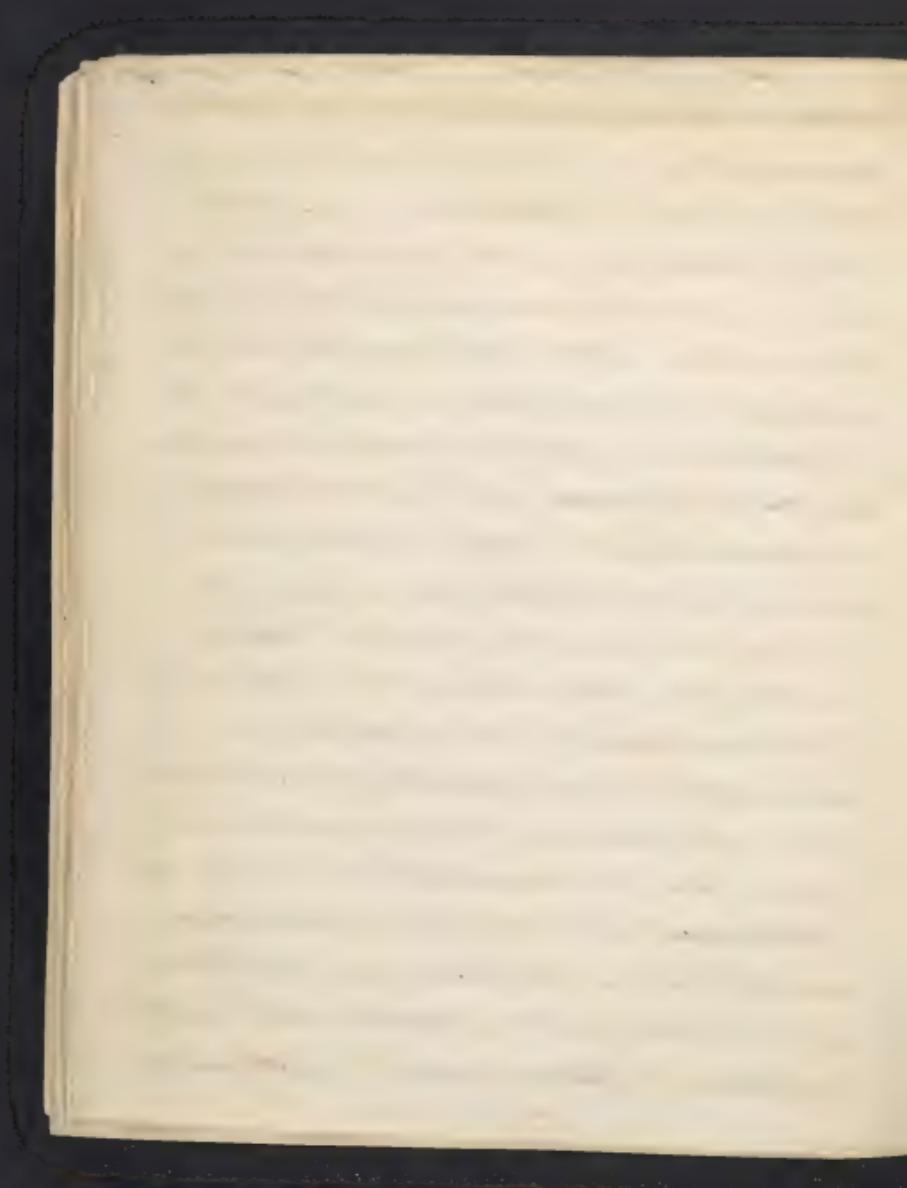
than partial, yet my reading has been of those auth-
thors who are looked upon as the pillars of their re-
spective sides of the controversy, and who have no
doubt done justice to their cause. From such sources
of information, and with such fair means to fix
my belief on either side of this controverted question,
I must unhesitatingly and unqualifiedly declare
that I do not know a single fact or argument to
countenance the belief that the yellow fever ever
was in a single instance communicated from one
individual to another, that it ever originated from
any other source than misnomer; or that its nature
is not the same as that of intermittent and remittent
fever, from which it differs in degree of malignity
alone. On the contrary I believe that there is almost
an unpar^{alleled} accumulation of incontrovertible
testimony, as well authenticated as that which sup-
ports any the most firmly established opinion; and
infinitely more complete and conclusive than what
is capable of being adduced in proof of ninety nine
hundredths of accredited and universally admitted (even

modern) historical facts, in support of the belief that yellow fever has always arisen from vegetable miasma; that it is of the same nature as intermittent fever; that it always has been, and always will be, equally incapable ~~with it~~ of being generated ~~and~~ ^{and} diffused or propagated by a specific contagion. That yellow fever arises from vegetable miasma I infer from the same grounds from which I infer the miasmatic origin of intermittent and remittent fevers, viz that it never appears except in places and at times when these miasms exist in a certain degree, and that it never fails to appear at such times and places, and that the same is untrue with respect to every other alleged cause.

"In Jamaica" says Dr. Hunter, "the fevers in the most healthy seasons are generally intermittent; in the rainy and other ~~and other~~ unhealthy seasons remittent?"
In temperate climates, regular intermissions prevail in mild seasons; but if the heats increase in intensity, or the sources of miasma be very abundant and the individual be either much exposed or unacclimated, the paroxysms will be more violent and protracted into a



remittent or even a continued fever. This is proclaimed throughout the whole of Sir John Pringle's volume, "the epidemic of autumn," he tells us, "and prevailing distemper of this (the Netherlands) and other marshy countries is a fever of an intermitting nature, commonly of a tertian form, but of a bad kind; which, in the deepest places, and worst seasons, appears as a double tertian, a remitting, a continued putrid, or even an ardent fever." Again, "In proportion to the coolness of the season, to the height and dryness of the ground, this fever is milder; remits or intermits more freely, and recedes further from the nature of a continued putrid, or an ardent fever" (p. 7). Speaking of the bilious fevers of the marshes, the same author observes, "These marsh fevers are not only apt to begin with little remission, but after intermitting for some days, to change again into continued fevers of a putrid and malignant nature; It is remarkable how much they vary with the season; for however frequent, violent or dangerous they have been in the decline of summer or beginning of autumn, when the putrefaction is at the height, yet before winter they are reduced to a small number;



become mild, and generally assume a regular tertian form.")
(p. 158) I might were it necessary extract from the same author numerous other passages of similar import. His description of the bilious fever of the camp and of the marshes shows that it varies in its degree of malignity, from a simple intermittent through all the intermediate gradations up to a putrid continued fever, according to the intensity of its cause, the season, the situation of the men, and the other accipiting causes.

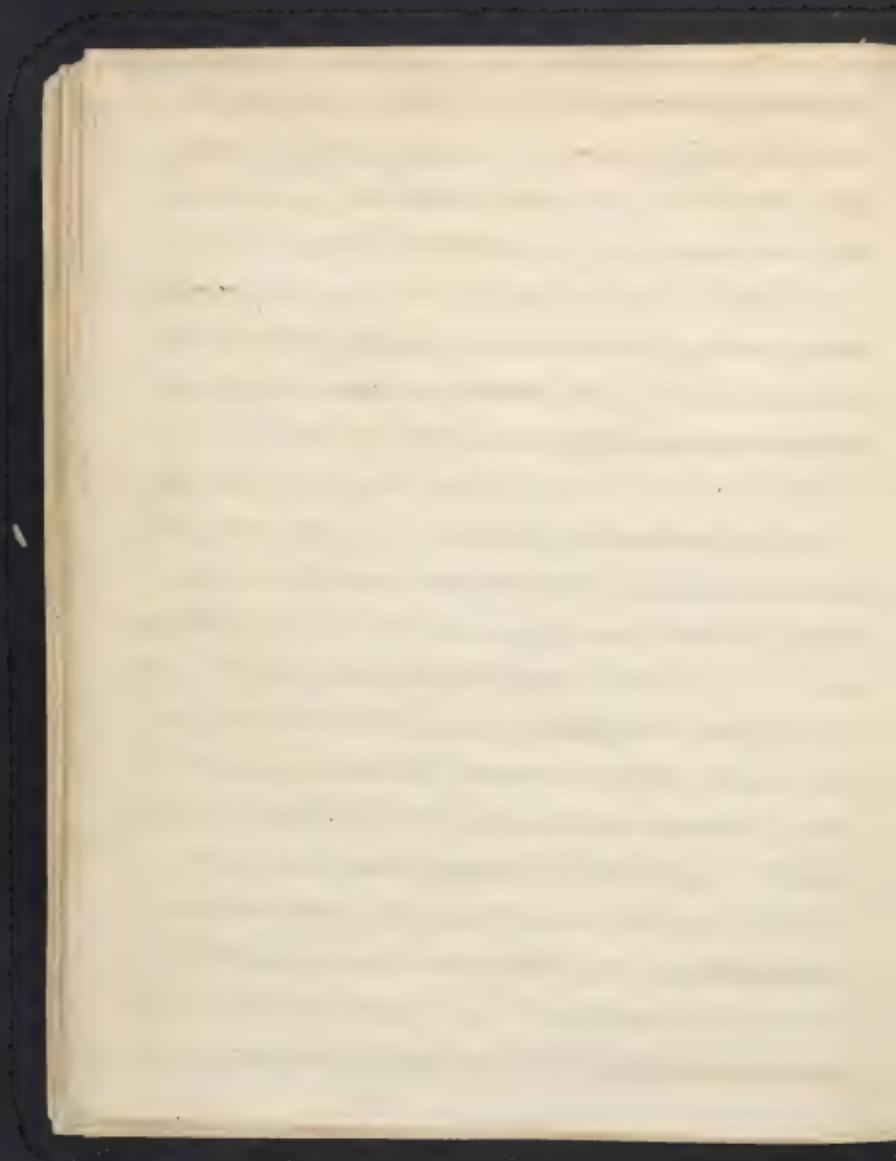
and has inculcated, throughout his whole work, the same opinion; and Dr Rush mentions that "the different grades of bilious fever, from the mildest intermittent to the most acute continued fever, have been distinctly traced by Lencisa to the same marsh exhalation."

The regular intermittent therefore may be considered as the endemic of temperate climates and seasons, and though it often prevails among the natives in tropical regions, when the sources of miasma are not very concentrated, or the heats intense, as on the mountains of the West Indies, it is never found epidemic in the neighbourhood of the equator. It is in these extensive and

unhealthy regions, that the remittent fever prevail, 8

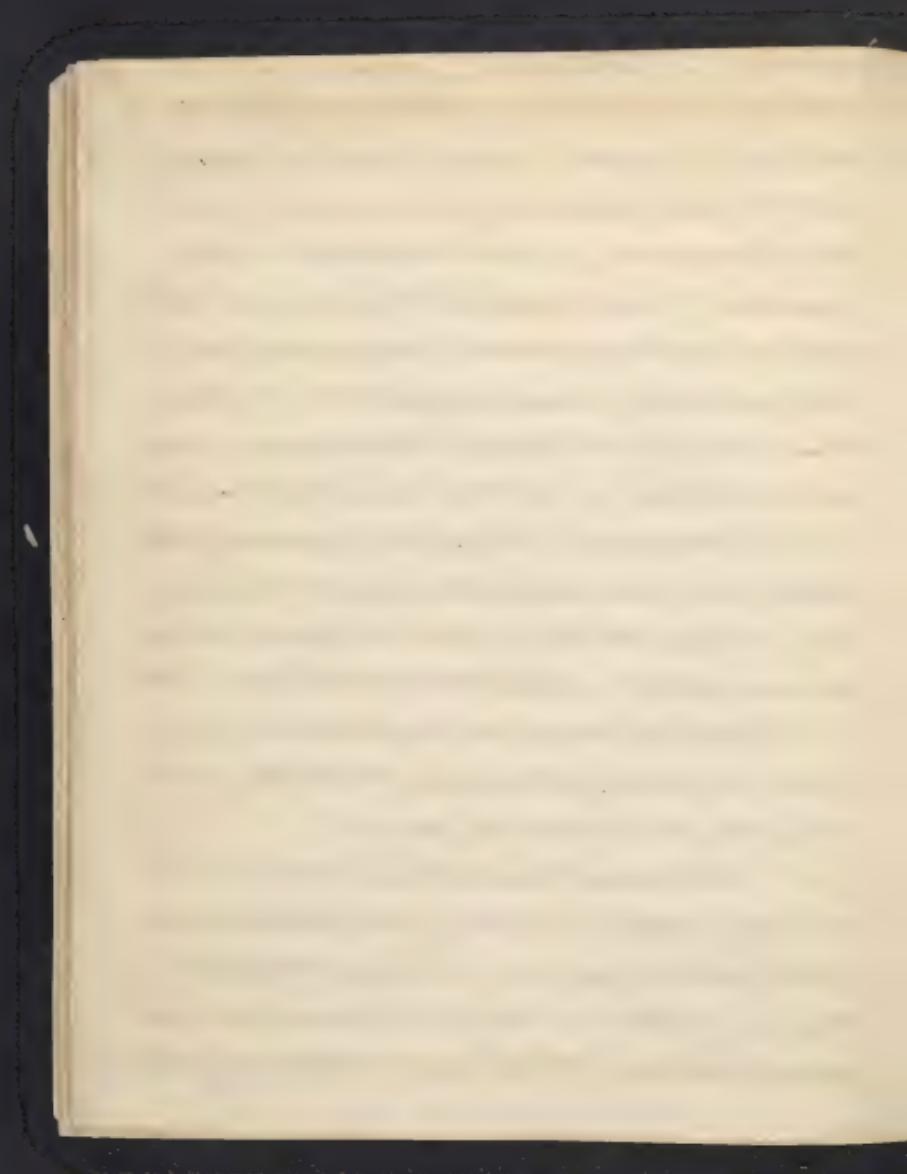
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during the long season of sickness, with great and often destructive malignity. This is the grand epidemic, the morbus regionalis of equatorial latitudes, and rises into a continued or yellow fever in seasons of unusual heat particularly among those not perfectly acclimated to the climate. It is this, that in its aggravated form, has cut down, the swarms of colonists from the North of Europe, that for some centuries past have been found upon these unprofitable settlements. The Dutch have melted away before the annual sweep of this malignant pestilence on that speck of Earth where they have fixed their Indian capital, the hot bed of disease, where "all life dies, death lives." But great Britain has perhaps most reason to reflect with sorrow on its destructive ravage. Wherever in intertropical regions, Britain's enterprise, i.e. extended British dominion whether throughout the Peninsula of India, on the coast of Africa, or in the unhealthy seaports of the West India Islands, there has she struck the bloom and health and vigor of her country, falling by, piecemeal before this voluntary malady. It appears that several conditions

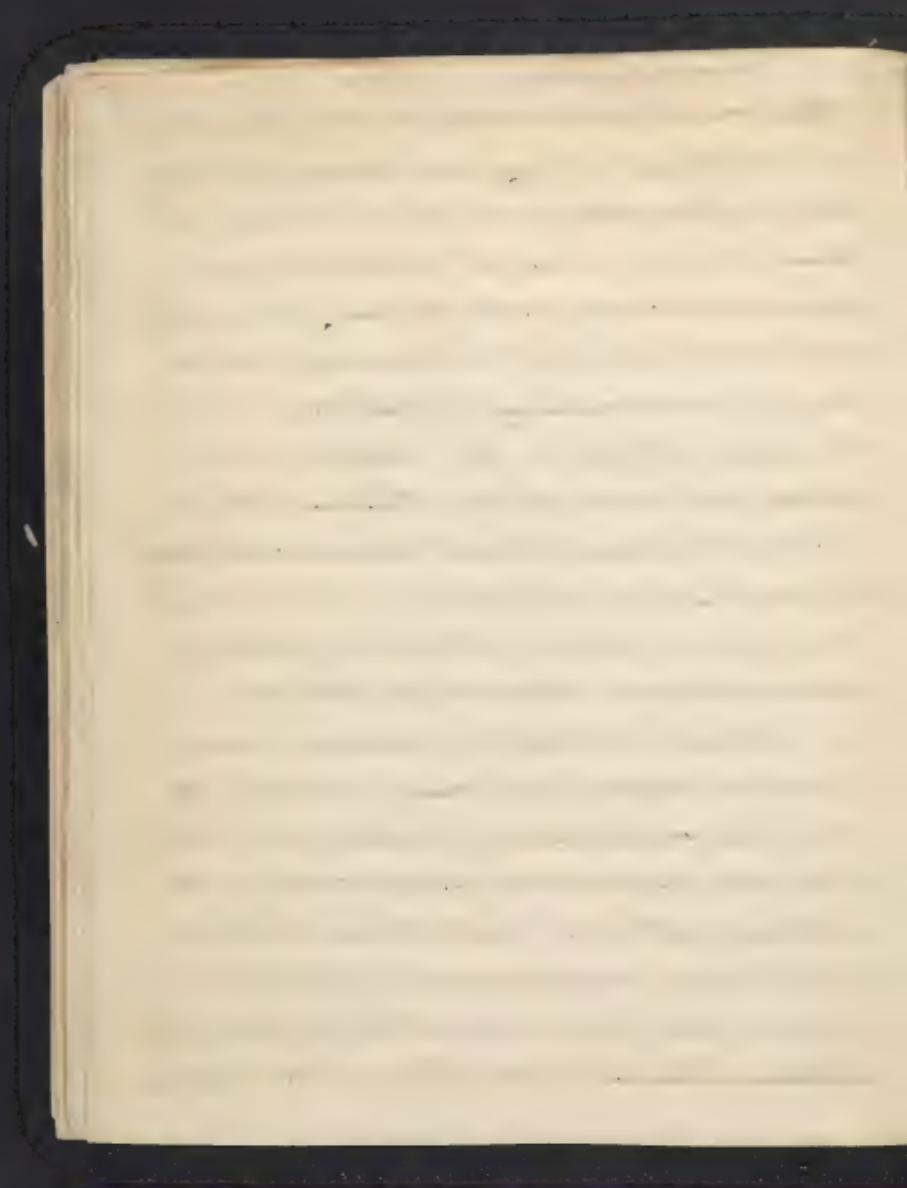


are necessary to the existence of yellow fever, so that its prevalence in any place is dependent not on an individual agent, but on a concurrence of circumstances, viz. the sources of the mass-mass of vegetable decomposition, a steady predominance of high atmospheric temperature, and that degree of susceptibility or absence of insusceptibility natural to the inhabitants of climates subject to a considerable annual range of temperature. That the origin of yellow fever is to be found in the concurrence of the circumstances I have mentioned, is, I think clearly made out by the writers whom I have read on the subject, but as every inch of this ground has been an object for dispute, it will be proper, without a formal citation of facts, which would be an untiring task, to refer to a few of the sources of proof in order to exemplify its nature, and to state some of the general consequences deducible from it.

Dr Bancroft has, with much research, traced the history of yellow fever in many of the West India Islands, in nearly all the large towns of the United States, and in three cities of Spain in which it has prevailed as a malignant epidemic. He has given the topography of each

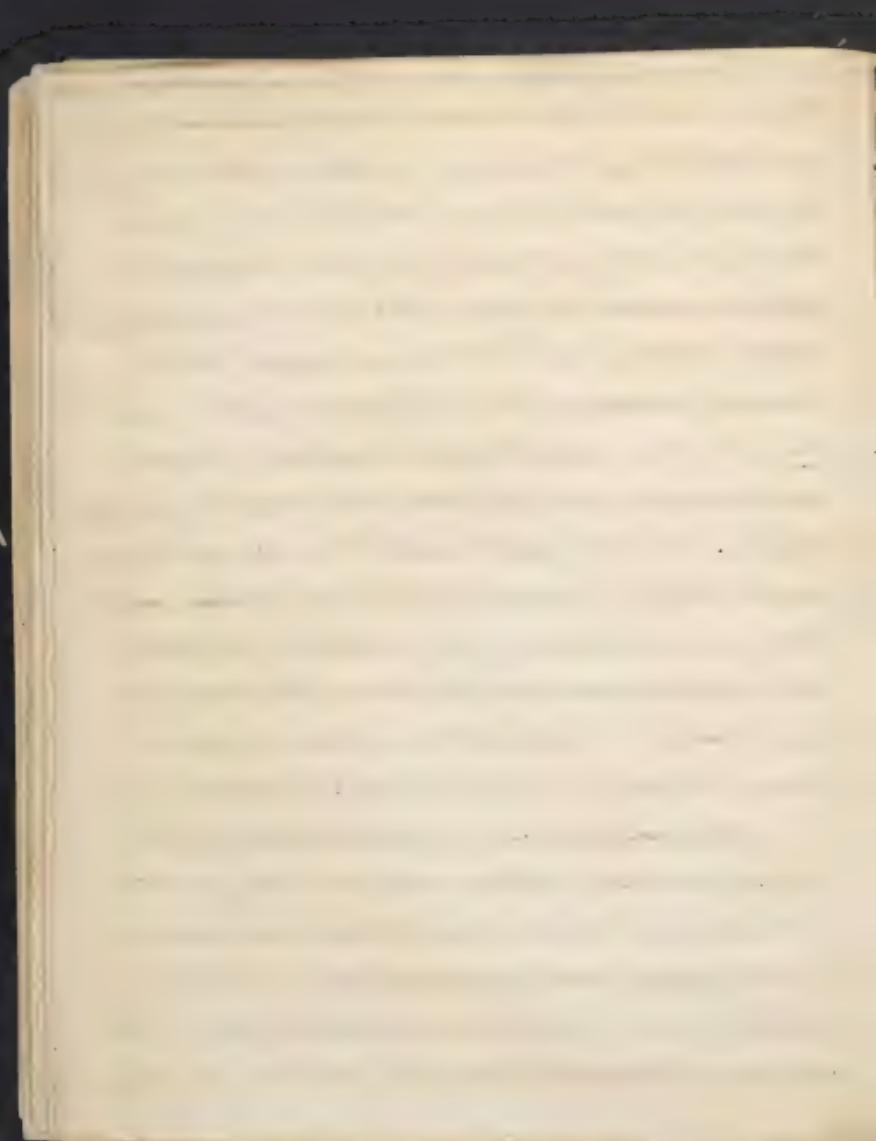


of these places with great minuteness, In all of these ^{various} ¹⁰ times, he has pointed out very copious sources of the miasma of vegetal decomposition, marked the limit of the spreading cause and shown that the disease has never transversed the boundary assigned, conformably to the circumscribed extent, beyond which, as I have already illustrated, there is the most convincing proof that the air noxious is incapable of being borne by the atmosphere with the relation of its mortific efficacy, The same author has pointed out the sources of Marsh miasma on ship board, and has given a number of instances in which he has placed it beyond a doubt that yellow fever originated from such sources under a cooperation of the other agents which are indispensable to the effect in question, In many of the medical journals of this country particularly the New York Medical Repository are to be found histories of the yellow fever as it has appeared at various times in different parts of the United States, in all which that I have seen, very copious sources of Marsh miasma have been shown to exist at the very seat of the epidemic, I find, in Dr James Johnson's work on tropical



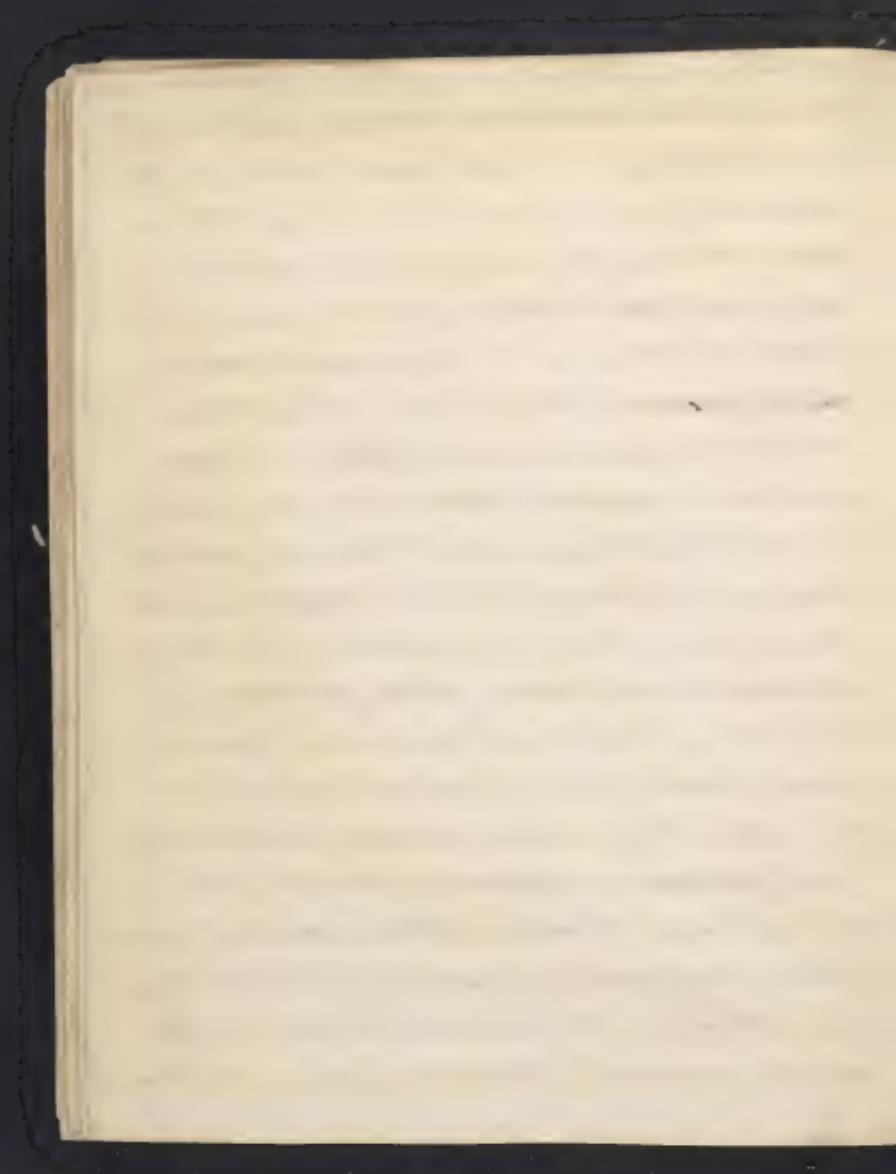
climate, accounts of the prevalence of yellow fever in some 11
parts of the Indian Archipelago, at Seringapatam, in
Bengal, & - all which places he describes as abounding in
marshes and other materials for vegetable decomposition;
yet such a disease is unknown throughout the whole sandy
coast of Coromandel. But it is not enough for the
production of disease that there be vegetable matter only
they are in a situation to suffer decomposition. Miasma
must be evolved during the putrefactive process before marshy
soil can mortally affect health. It is along the trying
margins of streams of water, which have recently been exposed
to the sun, in consequence of the subsidence of the waters
or their gradual removal by evaporation that miasma
can be formed in sufficient concentration to produce
disease. When there is a superabundance of moisture, they
are either prevented from being generated, or they are
perfectly inert and inefficient from their rarity and dilution.

In temperate climate, where the heats are moderate
and evaporation slow, vegetable matters require but
little moisture, beyond what is inherent in them in order
to undergo decomposition. But where the heats are intense

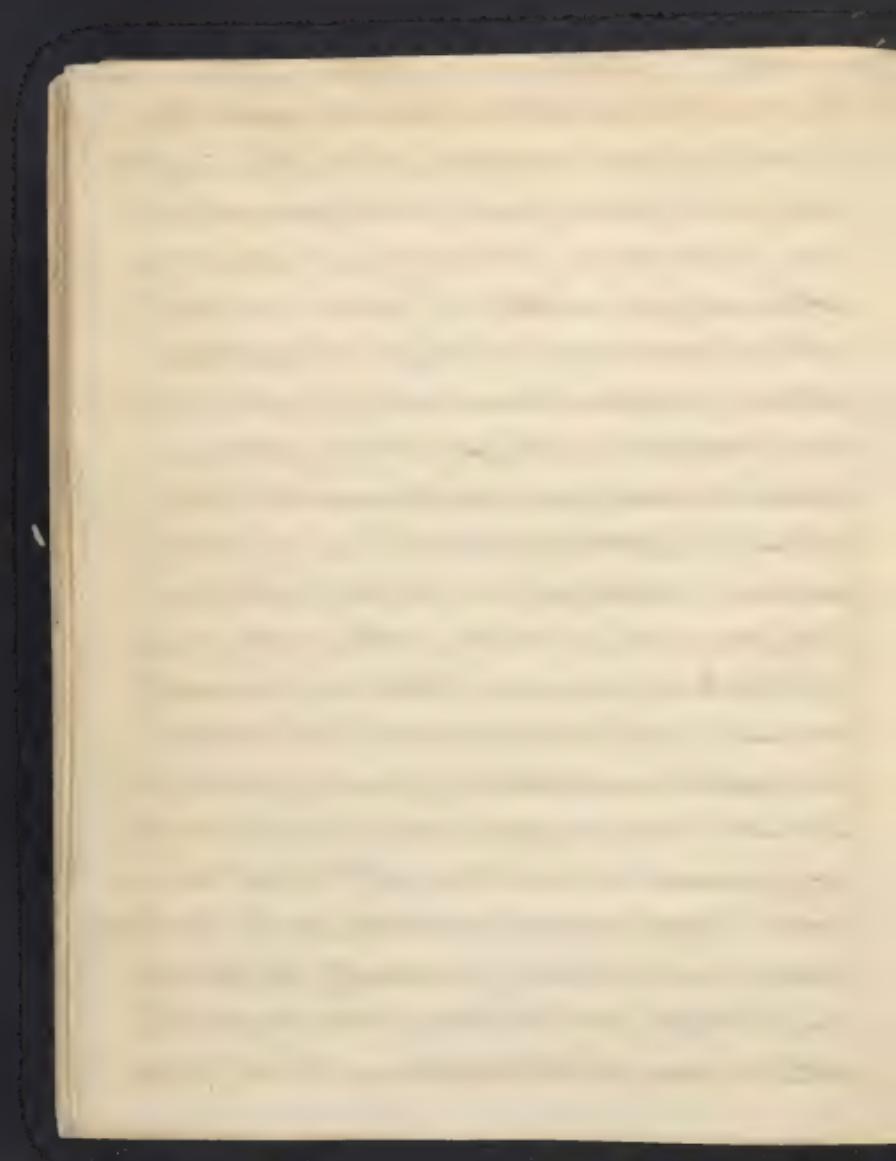


and evaporation very rapid, any superfluous moisture will soon be vaporized, and leave the organic matter exposed to the chemical agency of the sun. Hence we find that in tropical climates, soils naturally dry do not send up their mortific effluvia till, after the perittidal rains are over, they are, ^{or} far advanced in the drying process, and sometimes completely excavated. At such times, intermittent and remittent fevers make their annual appearance in these situations. Two requisites therefore for mortific miasma are rarely absent. During a part at least of the year in the generality of places, and atmospheric temperature, which forms a third, is almost annually present. During the summer months in intertropical latitudes, and occasionally so in many ultra-tropical countries in a degree to generate mortific effluvia of sufficient concentration to give rise to the milder gradations of miasmal disease.

But, for diseases of a higher and severer rank, such miasmaa require too weak and dilute water that degree of relative unsusceptibility possessed by natives and those habituated to a higher temperature. In such cases, the poison is incapable of effects so deleterious. Possibilities



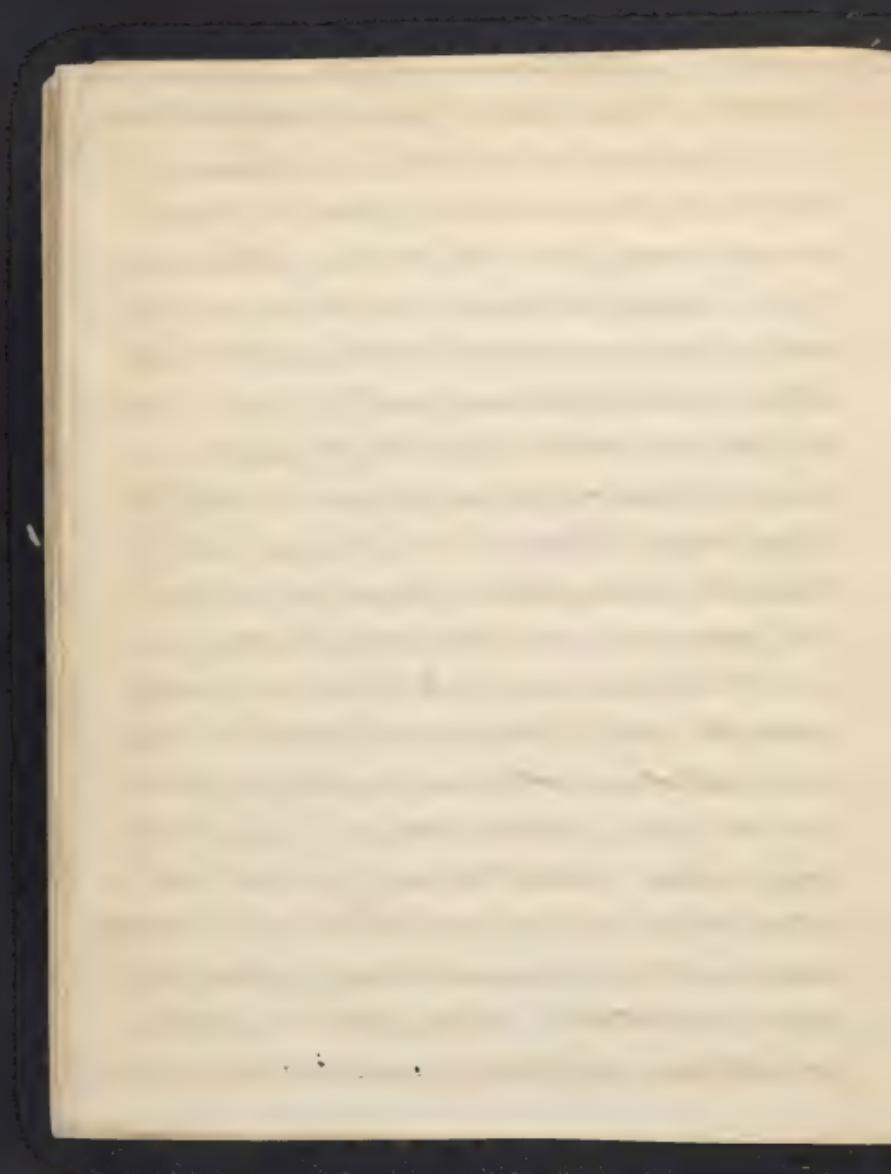
has so gradually the relation between the excitability of 13
the native and apportioned system, and the stimulus of the
various, so that noxious agents of such perennial exis-
tence in all warm latitudes may be incapable of
extinguishing the nobility of his works. Consistently
with the preservation of the human species, marsh
effluvia of sufficient concentration to exert their
morbida consequences through all the gradations of
miasmatic disease from simple intermittent up to
malignant yellow fever, must be of only occasional
existence. Accordingly we find that nature has
kindly confined their production within certain ranges
of atmospheric temperature, which are of infrequent
occurrence. More ordinary degrees of heat operating
upon vegetable matters capable of generating yellow fever
it would be found to affect upon the occurrence of
every summer in more than half the countries in the
world. It requires for its production, as has been above
stated, a previous duration of unusually high tempera-
ture, & therefore, as before observed, acts very much
with the degree of heat to determine its existence in



any place. This is the great regulating agent which 14
limits its appearance down to a more occasional
visitation, moderate temperature produces a poison
powerful enough for intermittent; a higher tem-
perature is necessary for remittent; whilst one unusually
exalted is indispensable for an epidemic yellow fever.

That this should be the case, would, a priori, be sus-
pected by one who believed in the identity of nature and
diversity of degree only of these diseases, the reality of
which identity I shall make it my business, hereafter,
to illustrate in order further to confirm the correctness
of the assignment of yellow fever to a miasmatic origin.

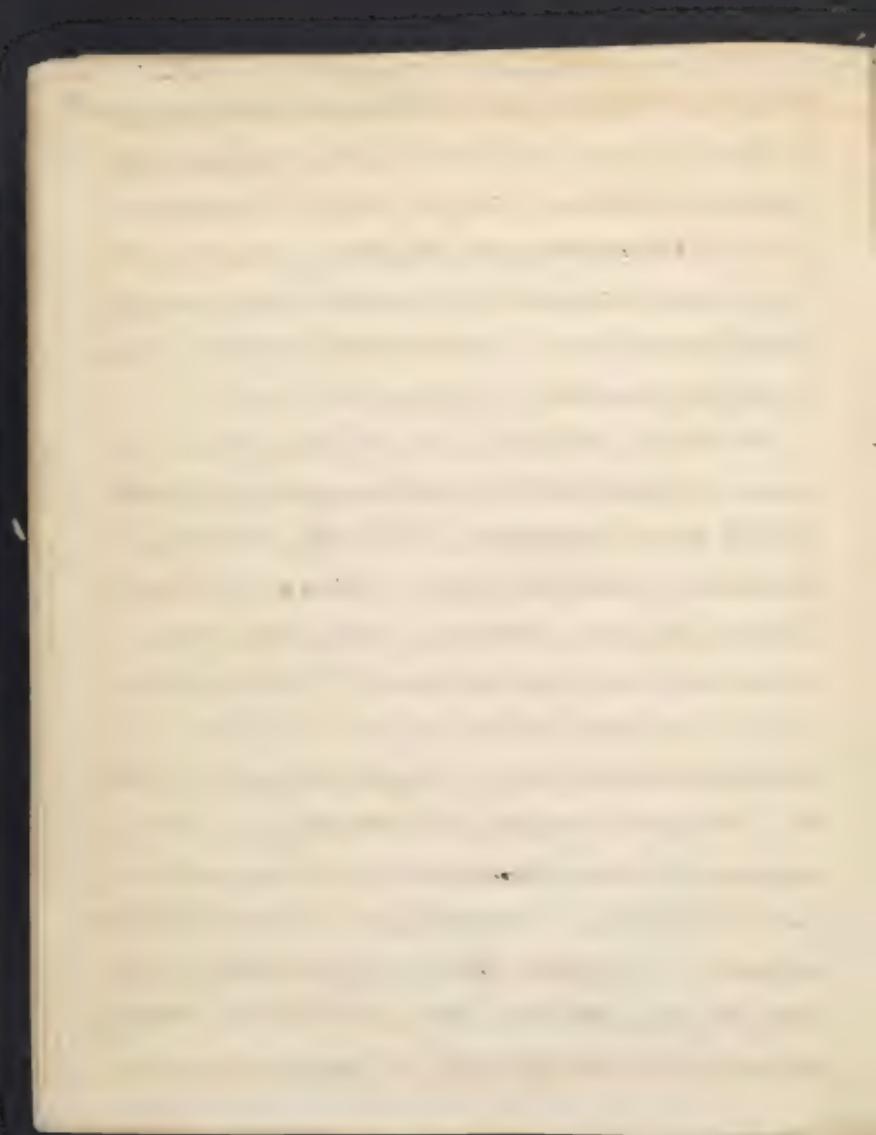
But, the persistence of yellow fever upon a steady
invasion of high atmospheric temperature in mis-
matic districts, or rather upon vegetable miasma
of such a degree of concentration as is incapable of
being produced without the agency of such a tem-
perature, is to be, positively, proved by a reference to facts
alone. - In all the numerous histories of epidemical
yellow fever collected by Dr Bancroft, and which are
not suited for a particular purpose, but are all that



he could find recorded with any degree of accuracy and on 15th
noticing in the space over which he has passed, are found
statements of the temperature, previous to and during the
prevalence of the disease and also upon its decline and
cessation, these are all from authentic sources, and
many of them official, so as to place their correctness
beyond the possibility of suspicion. In every instance
the temperature was steadily unusually high for some
time previous to the appearance of the epidemic and also
during its continuance, and in no case did the disease
decline till the reduction of the temperature, at which time
it uniformly ceased. So certainly is this the case at Atlanta
that it is a matter of mathematical accuracy; for it
has been ascertained by records of temperature since the
year 1793, that, in that city, yellow fever has prevailed
every summer in which the average heat of June and
July has exceeded 79 degrees, and that it has, proved most
destructive when the thermometer has indicated the greatest
elevation. Without descending further into particulars
suffice it to say that in every history of an epidemic
yellow fever in which the degree of temperature has been

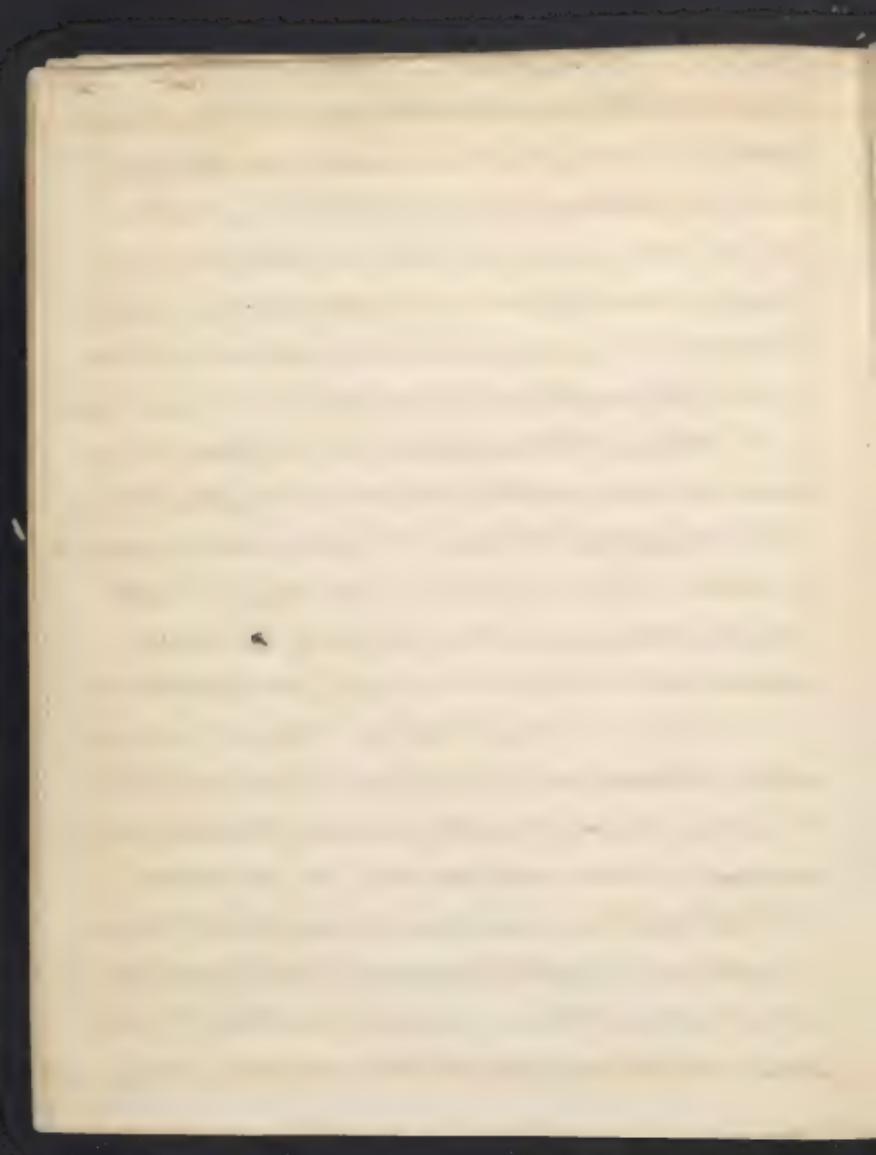
recorded, it has been stated to have been maintained for 15
a long time at an unusual height at the rest of the
season, and to have declined and ceased on the appearance
of cold. As this state of the atmosphere is attended with
long continued droughts the vegetable world is generally
a partaker with man in the wise of general calamity, and
is often the unwelcome harbinger of the sequel.

I am aware that there is much ground for misappre-
hension on this subject, and that so general a deduction
is liable to misinterpretation. It has been judiciously
remarked by Dr. Bickham that, in climates where the tem-
perature is variable, results, drawn from the greatest and
smallest elevations of the thermometer at certain periods,
give no information respecting the mean temperature; for
from inattention to this point, in discussing the question whether
the heat might be considered as extraordinary in epithemic
seasons, it has been affirmed that the heat was greater in
some healthy, than in unhealthy years, because the thermo-
meter rose a few degrees higher in the former than in the
latter. The same author tells us that in the Caribbean Archipelago
the temperature is not only high, but equally and durably so;

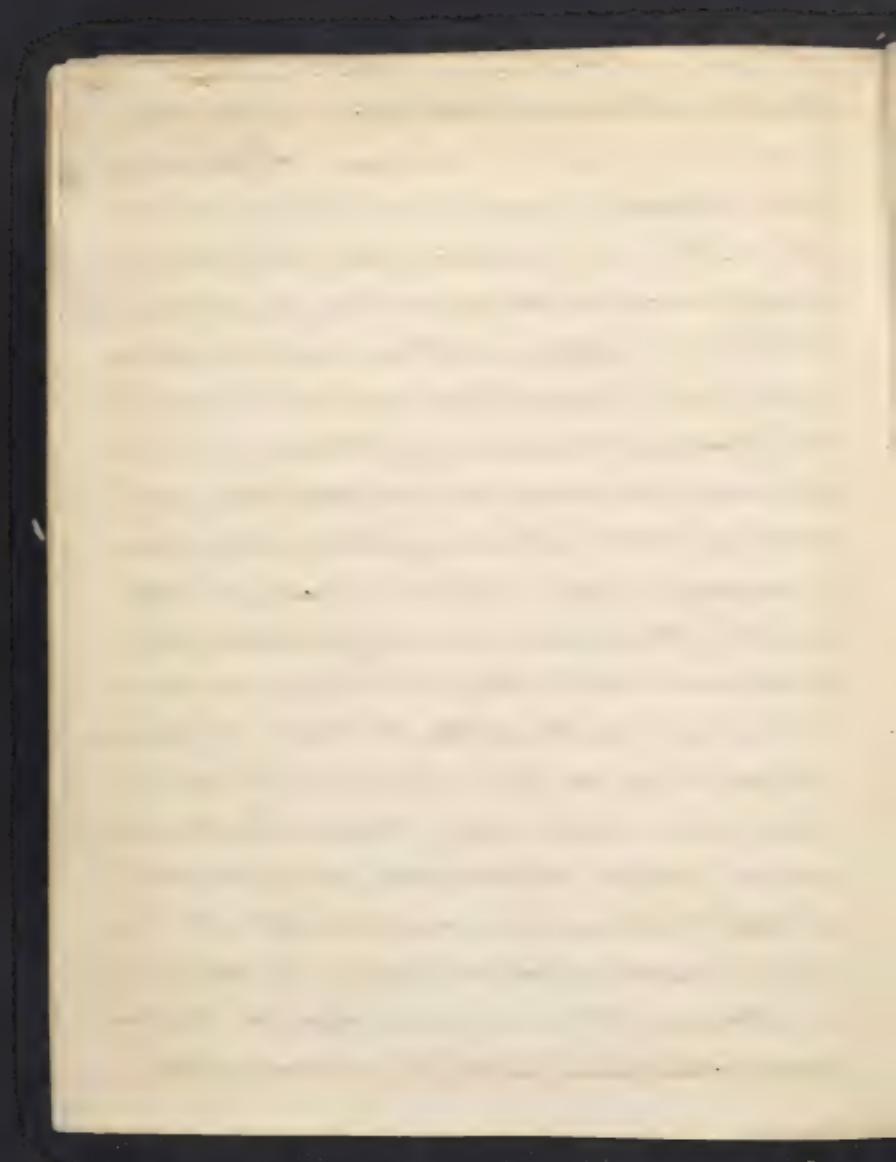


and from its little variation in this respect, he considers the 17
yellow fever as the legitimate product of the climate; for
in the more southern colonies on the Continent, where,
from the vicinity of wood, mountains &c; the temperature,
though often as high, is not uniformly so; and where
the winds are more variable, and the nights cooler, the disease
is much less prevalent, and often assumes a remittent type.

The college of Physicians appear to have fallen into an
error on this point in their report to the Policy Council,
wherein they express the belief that yellow fever may prevail
in Britain, because, they say, the temperature of Gibraltar
when the disease prevails there falls short of the average
summer heat in England. But in reply to this statement,
it has been well observed that in those places in
North America and the Spanish Peninsula, which
have been occasionally visited by the epidemic, the me-
teorological observations concur in the, pre-existence of
high atmospheric temperature for many weeks before
its appearance; whilst temperature to this requisite
extent seldom obtains in England, and when it does
occur in a climate of so mutable a character, is very

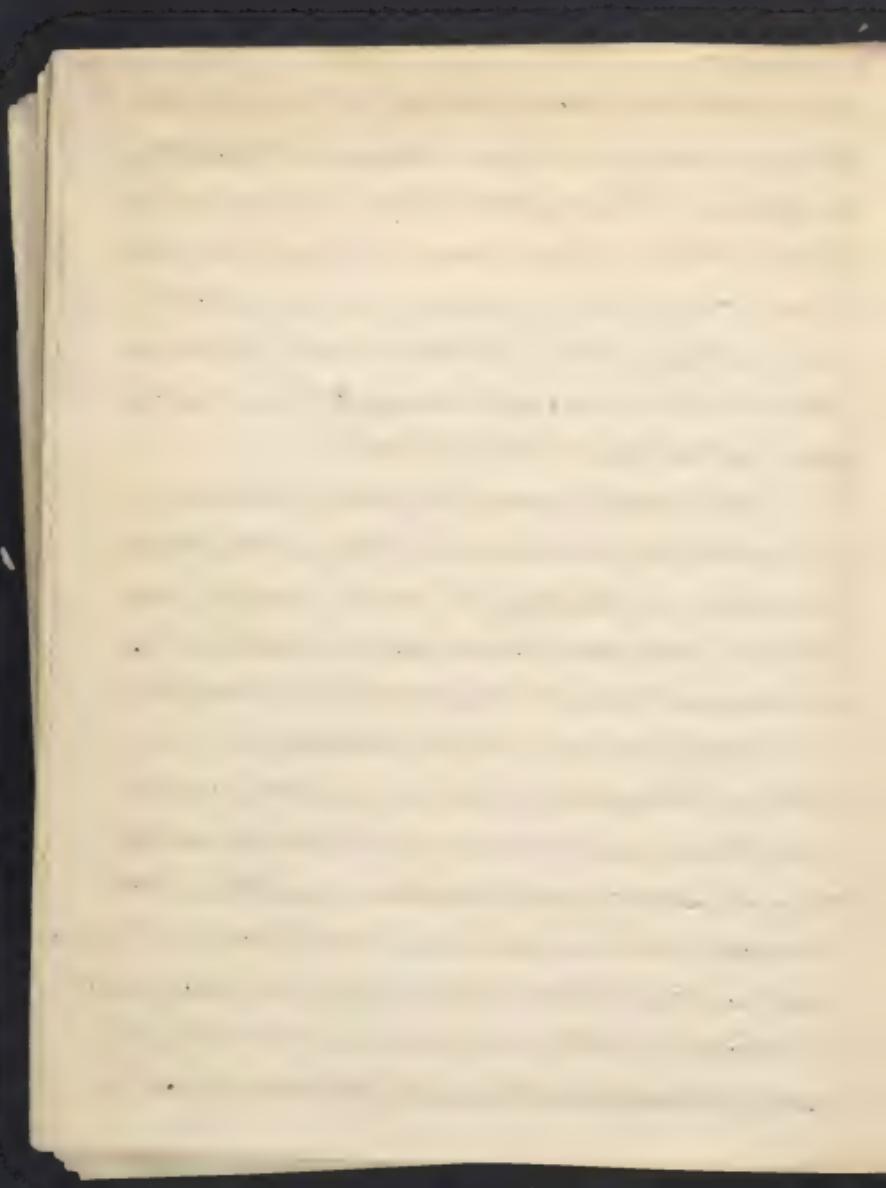


transitory, such emanental influences is totally inadequate to the production of the disease. Another avenue for the admission of error into our estimate of the degree of temperature in any situation is the presumption of its equality under equatorial parallelism and propinquity of locality. The difference between corresponding latitudes in the two hemispheres has been estimated at between 12 and 15 degrees, and the dissimilarity of climate, even between the eastern and western sides of the New Continent, is sufficiently great to reflect a very striking influence over the malignity of disease. At Lima, for example, which is but a little farther on one side of the equator than Cartagena is on the other, the heat is far more moderate, and at Quito, though close to the line, the thermometer does not rise so high in summer as it does at Paris. In the opposite sides of Mexico, where the distance is much less than across the other parts of the continent, the effect on disease is so considerable, that while Veracruz is considered as the chief seat of the Asiatic cholera or yellow fever, it has never been observed on the West Coast of New Spain, though bilious fever & cholera



maladies are there found to prevail, even in the short 19
distance of fifty miles between Panama and Portobello,
the difference is so perceptible, that, as Ulloa remarks the
Inhabitants attached from the former to the latter,
"though coming from a place so near, are affected to
such a degree, that, in less than a month, they are so
attenuated, as to be unable to do anything till custom
again restores them to their strength!"

In equinoctial regions, the effect of elevation is
equivalent to that of latitude. The Mexican mountainers,
we are told, in mounting the eastern declivity of the
Cordillera from Cerro to the coast, in sixteen hours
are transported from the temperate to the torrid zone,
and suddenly plunged into the extremely hot and
 deleterious atmosphere of Bora Cruz and thus exposed
to all the dangers of a new and fatal entomological dis-
ease. In ascending this elevation, says Humboldt,
the sight of the Mexican oak, at the foot of S. Concio
which is 3743 feet above the level of the ocean, quietes
the alarms of travellers newly landed at Bora Cruz. Its
presence demonstrates to them that they have left behind



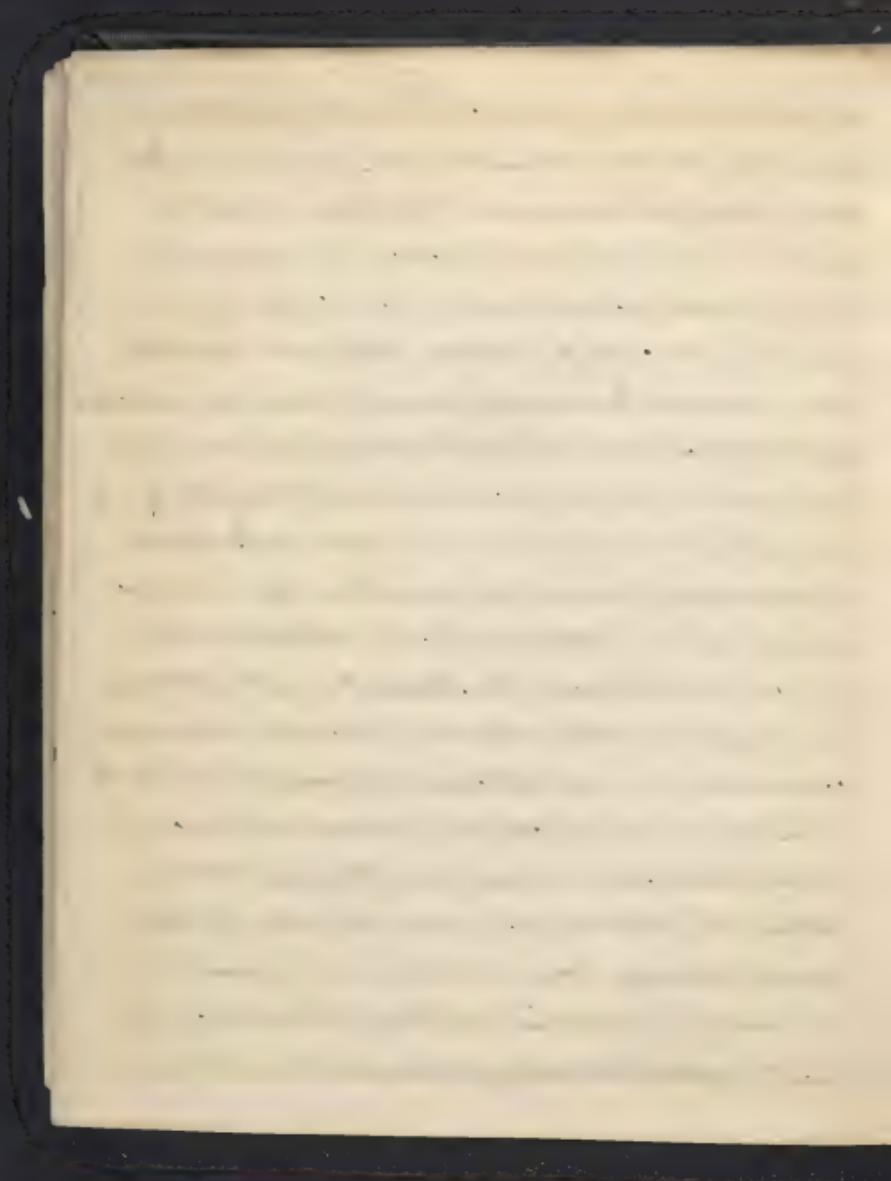
them the zone so justly created by the people of the 20
North, under which the yellow fever exercises its rav-
ages in a new species. The difference of temperature
between cities and the surrounding country will help
to account for the far greater frequency of occurrence
of yellow fever in the former than in the latter situa-
tion. This frequency has erroneously been supposed
to favour the notion of the importation of the disease,
and its dependence on contagious communication.

The reality of such communicable power will be
considered in its proper place; mean time, the fact of
which I am speaking is referrible to another cause,
and completely explicable on a different principle.

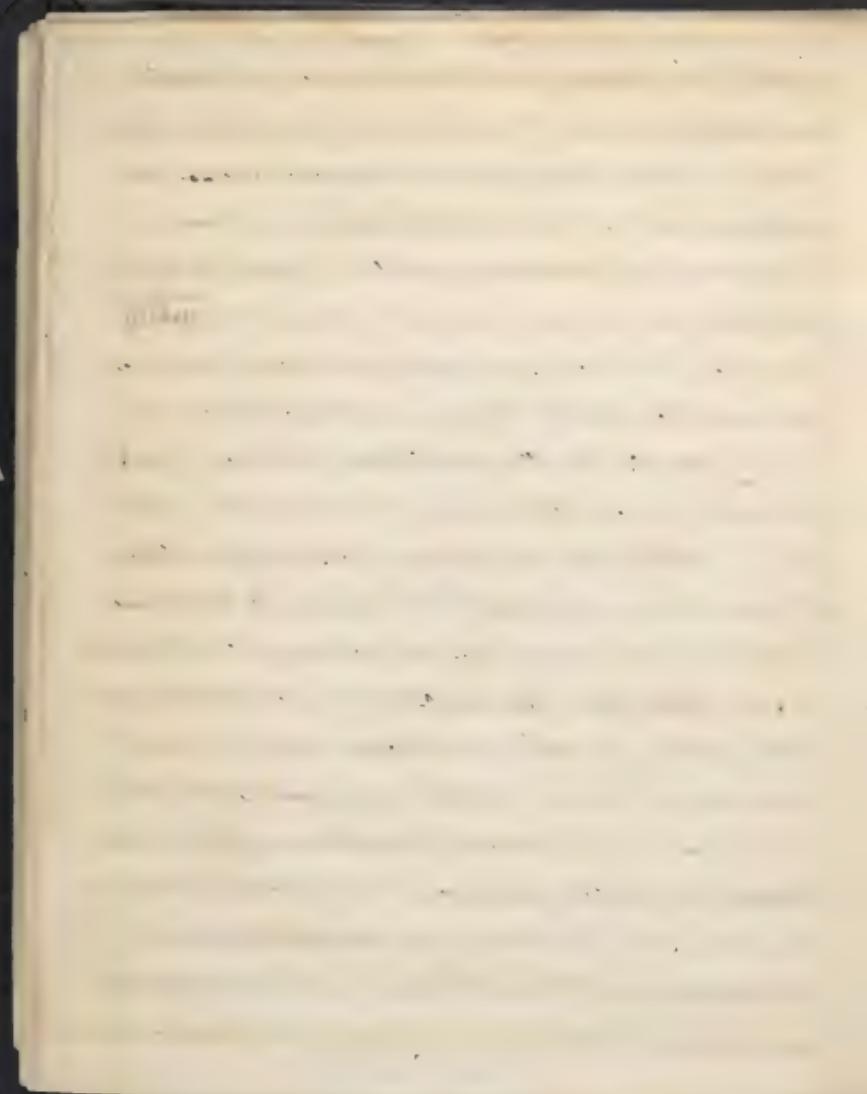
Any person who believed yellow fever to be the result
of the combined operation of the circumstances I have
mentioned, would at once pronounce, before he was ap-
prised of the fact, that this disease would appear infinitely
more frequently in cities than in the country. Large
towns exhibit a much higher range of temperature
than the country and at the same time, possess more
ripe and abundant materials for decomposition than the

West Indies the country is open and in general exposed 21
to cool and refreshing breezes, whilst the towns, as before
remarked, are, for the sake of commerce, positioned in low
temperate situations, in valleys about the openings of rivers
and the bottoms of harbours and other large inlets of water,
from which the winds are shut out, and where the white ex-
uviae of the vegetable world accumulate, stagnate, and
decay beneath the fierce unmitigated beams of a burning
sky. In North America also, the cities are notoriously
many degrees hotter than the country, and in seaports espe-
cially, the collections of vegetable matter at the wharves
send up effluvia of a degree of concentration equal to
what is to be met with elsewhere, in those seasons, in
particular, which long continued heats and unusual droughts
have afforded such materials ample opportunity for
decomposition. For the reasons above mentioned, as well
as for another very efficient one presently to be noticed,
yellow fever always has been and, unless very different
sanitary regulations than what at present obtain be insti-
tuted and rigidly enforced, always will be a disease
principally of low, crowded, and commercial cities, whilst

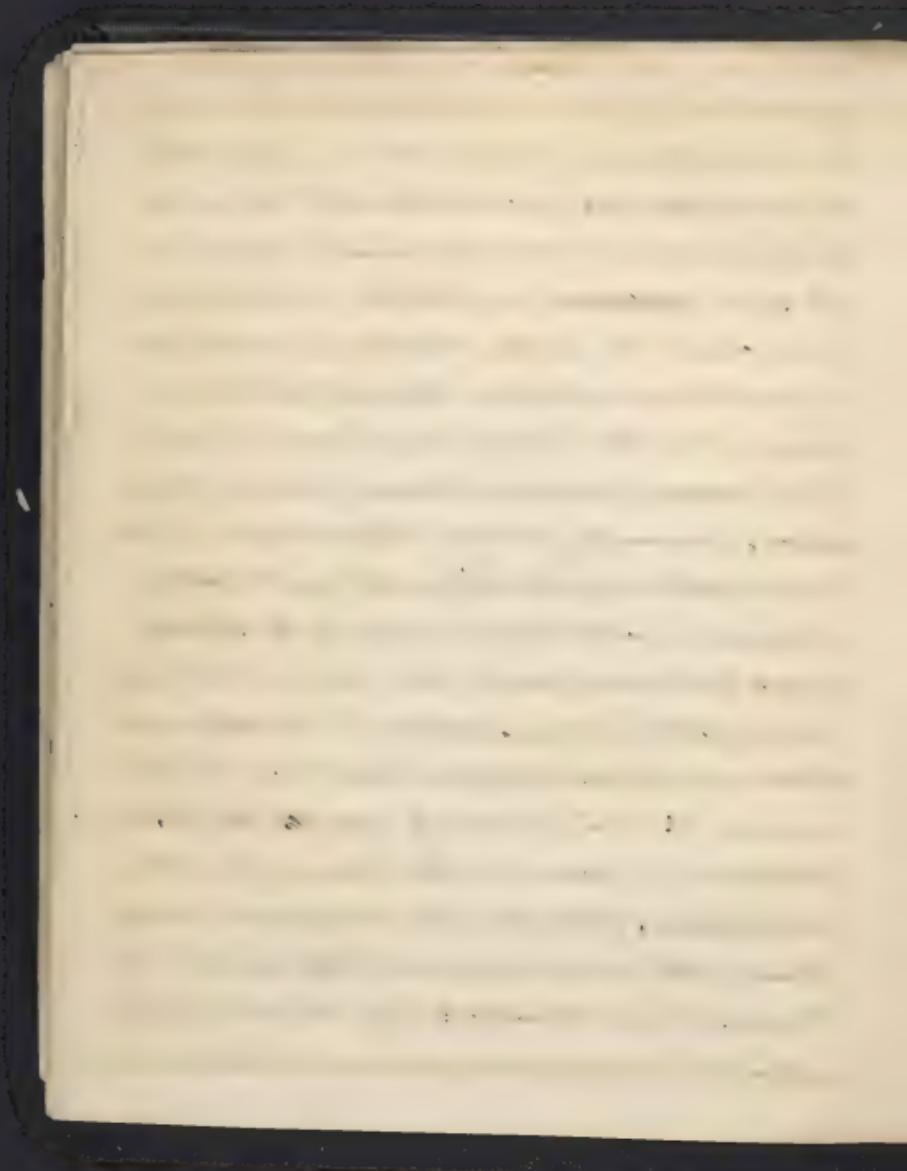
the higher and more airy situations have nothing to fear 22
from it, though I could adduce numerous instances in which,
during intensely hot summers, it has broken out and pre-
vailed in low marshy districts in the interior of the
Country under circumstances in which all possibility of
importation was certainly precluded. All of our towns, that
are situated on low marshy ground, for maritime purposes,
particularly those at the South where every thing, even health,
is disregarded in the eye of commerce, must during every
unusually hot and dry summer be more or less the seats
of yellow fever. The ponds and marshes in their immediate
vicinity, the large extent of those left exposed to a hot
sun on the subsidence of the tides during long droughts,
the decayed vegetable material of which the wharves are
composed and the vast collections of organic remains with
which they are almost constantly covered and surrounded
furnish materials for disease of nearly unequalled concen-
tration when operated upon for a long time by heats of
unusual intensity. One situated on low ground in
the vicinity of marshes, was, during her infancy, fre-
quently subjected to wasting epidemics. When at the



height of her prosperity and magnificence, the marshes 23
were drained and the city preserved free from impurities and
filth, it became healthful, and miasmatic diseases were
no longer heard of. But when the empire was overrun
by the Northern Barbarians, and the aqueduct broken
up, Rome became again the seat of frequent and malignant
epidemics. Were Roman vigilance and Roman municipi-
al regulations applied to freeing our seaports from the
marshy grounds, the alluvial collections, the black vegeta-
ble mould which fattens their outskirts, and the organic
remains that ^{are} suffered to putrefy in vast accumulations
at their wharves, they might bid defiance to the ravages
of yellow fever, or even offer a locution for its impor-
tation within their limits. As they are at present sit-
uated, containing within their bosom such abundant
materials for disease, exposed every year as they are
to a degree of inter-tropical temperature sufficient to
develope the milder gradations of miasmatic malady in
the native system and one of a severer type in the
stranger from a northern latitude, they must remain at
the mercy of the season, suffering, as they have heretofore done

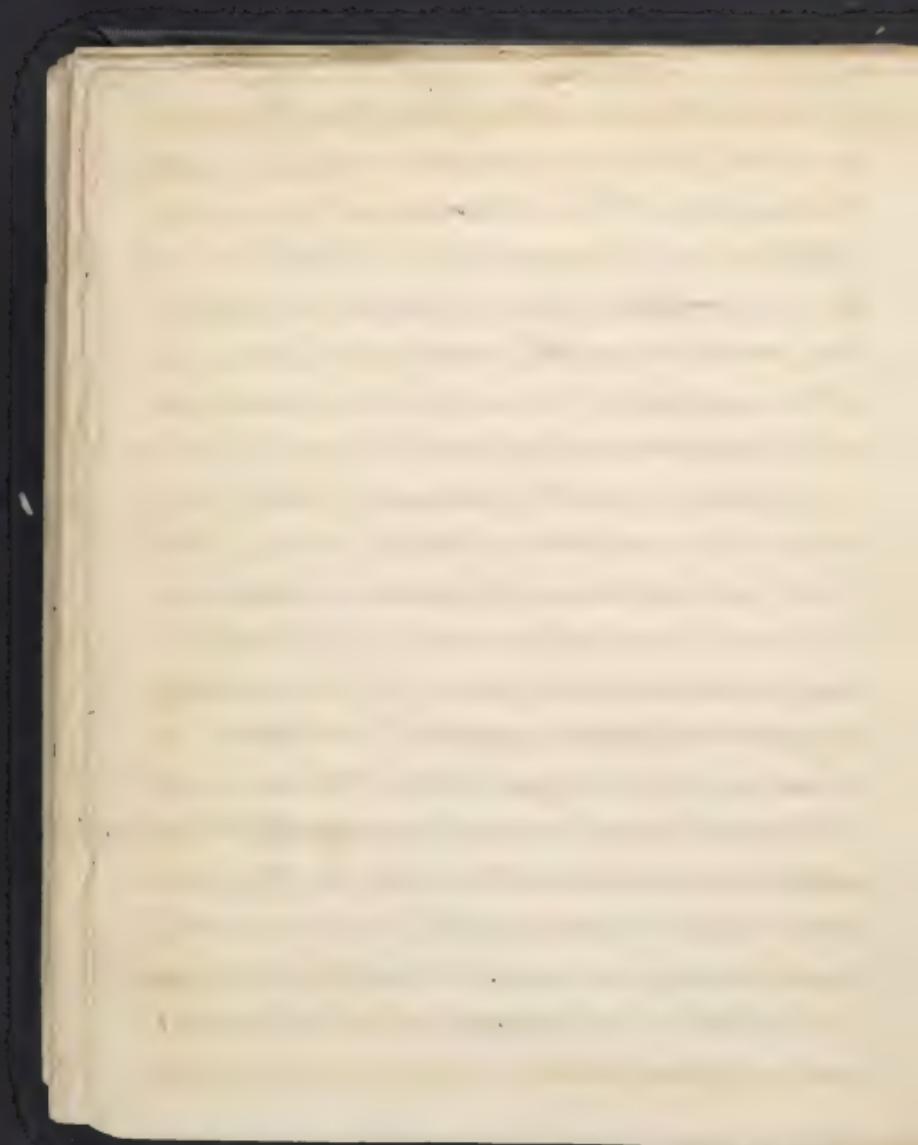


a general yellow fever, whenever the heats are unusually high and steadily intense, and which will continue till either the gradual subsidence of cold, or the salutary deluges from the clouds shall have reduced the temperature, refreshed the atmosphere ~~and diffused~~, precipitated the marsh miasma, and checked their further production and elevation, and invigorated the animal system. Conformably to the above views, we find that, in all the seaports at the South, the mildest gradation of miasmatic disease prevails in the outskirts and surrounding country, whilst yellow fever is ripe in the neighbourhood of the wharves. The greater elevation of temperature in cities affords a station of the sporadic existence of this disease for some time previous to its sudden bursting forth as a general epidemic, and explains all the erroneous opinions that have resulted from this phenomenon. As the heat of the city is greater than that of the country, the former will have become sufficiently intense to generate yellow fever from the occasional causes of disease within its limits, before the latter has risen to the requisite height to extricate from the marshes miasma sufficiently powerful to produce an epidemic. But



if the temperature rise still higher, these latter will 25
send forth effluvia of sufficient concentration to render
the disease general: hence a sporadic yellow fever may
be produced from local causes before the heats have risen to
the height requisite to generate an epidemic;
from general sources, the preceding circumstances are
I think sufficient to account for the epidemic preva-
lence of yellow fever whenever and wherever it has prevailed.

I would now offer this absence as a reason for its
absence whenever and wherever it has been absent. I think
it will explain the absence of the disease in situations free
from vegetable matters and in countries in which the heat
never attains the elevation and duration which has been specified
as requisite to the effect in question. It will explain its
absence, in countries subject to it, in those years in which
the temperature is not permanently unusually high; its non-
operation, in summers when it does occur, on the superincumbence
of cold, or the fall of considerable quantities of rain; and the fact of
it never prevailing in the winter. We have a right to require
of those who believe in the contagious origin of yellow fever, to
inform us how these phenomena are solved by their hypothesis.

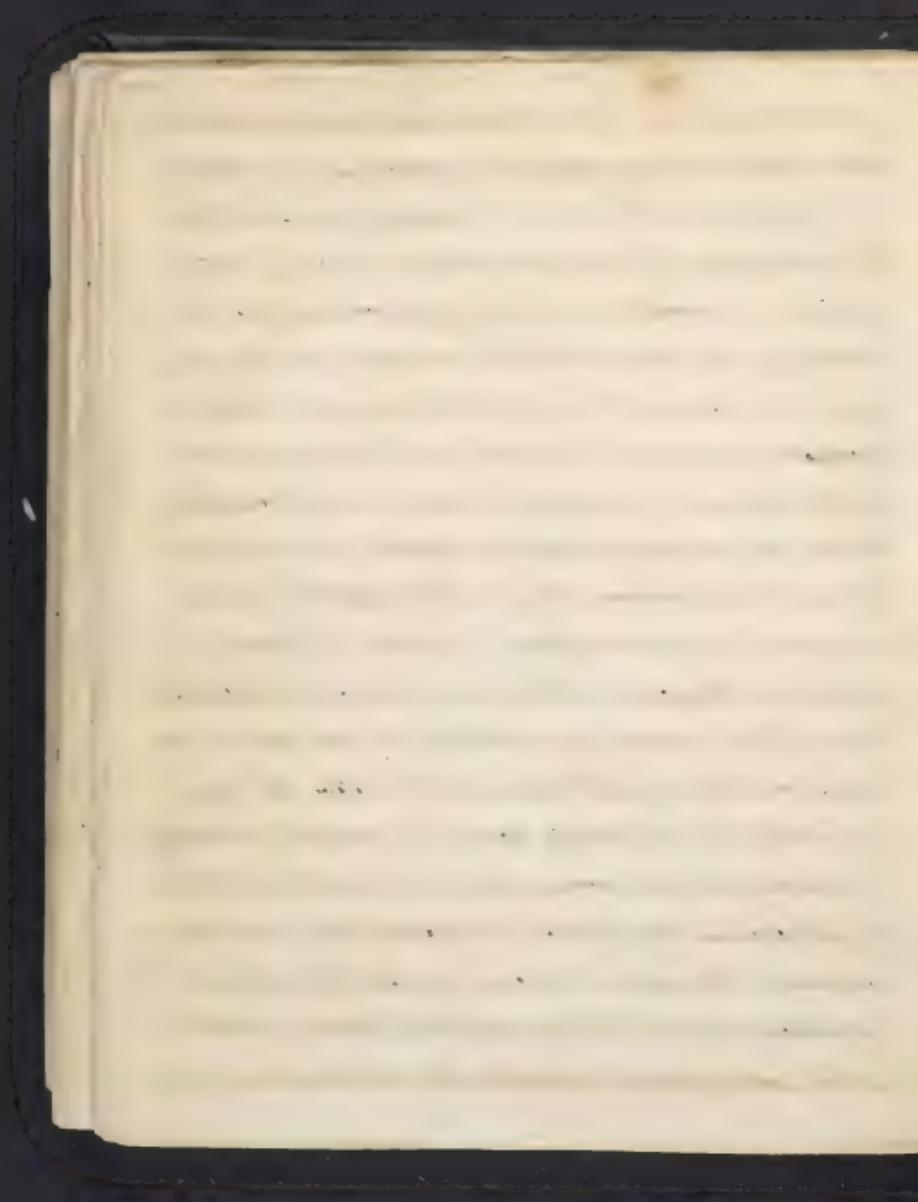


Accordingly I shall not wait, when I come to consider 20
the merits of that case as explanatory of the disease in question,
to examine whether the phenomena it is universally observed
are to exhibit correspond with such as we would a
priori expect it to exhibit if it depended for its origin
and propagation on a contagious principle. There is one impor-
tant circumstance yet to be noticed before concluding the
consideration of the miasmatic origin of yellow fever. I have
hitherto been speaking of it exclusively as an epidemic
prevailing among the natives of a country. I am now to say
a few words in explanation of its appearance as a pheno-
menon confined in its attacks to foreigners. In this case, the
above conditions mentioned as essential to its existence may
appear not to have been complied with, and the disease may
seem to have destroyed the laws which I have mentioned to
govern its production; but let it be remembered that the
force of stimuli is always relative to the excitability of the
system to which it is applied, and that a junction of two
perfectly inoperative and innocuous in a relaxed state of exci-
tability, would prove adequate to its arrangement to bring on
excitation in an opposite condition. The native system is placed

Detta är det endast det
som är det endast det
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beyond the influence of climate, and has therefore to contend 27
against the individual agent, the materia morbis alone.

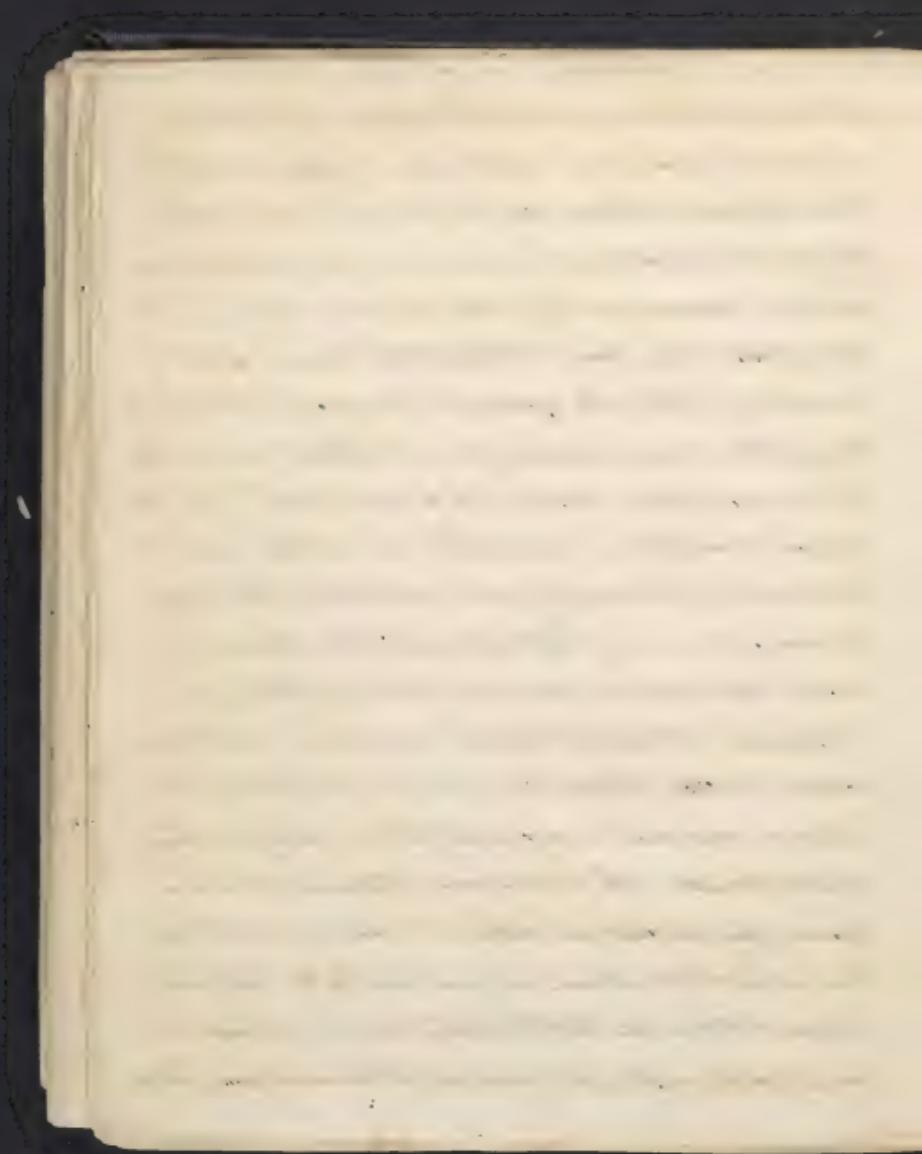
It is only then, when this is unusual and excessive, that
it produces malignant effects; which will always ~~extens~~^{extreme}
~~paribus~~ be graduated in intensity proportionately to the
intensity of the cause. But the unacclimated and conse-
quently unprepared has a double agency to contend
against, and his system, debilitated and excited
by the influence of a foreign climate, would be unable
to resist the power of a stimulus altogether insufficient in
the native, and become very morbidly affected by a force
incapable of aggravated effects in the latter. The excessive
temperature therefore, which has been mentioned as indispensable
to an epidemic yellow fever, although it does produce some
disposition to disease in the native as being
higher than he is habitually exposed to, is operation principally
in exciting the vis morsis, marsh miasma, in degree
of perfection and concentration. In seasons then of ordinary
temperature the native is secure against the malignant
gradations of disease: his insusceptibility however is not
determinate, specific, or absolute, like that conferred by the



various poisons, but is altogether relative and contingent, —
dependent for its duration, on the seasons and, to adopt the
language of Mr Sheppard, to be acquired as certainly, though
more gradually, by tropical residence, as by having passed
through an attack of the disease — a condition of habit which
confers security only when the concentration and force of
the entomie causes do not exceed the degree to which the
individual may have been previously habituated; — and
lastly a means of exemption which is liable to be destroyed
by the regenerated susceptibility which a return to a res-
idence in a northern climate effectuates. This relative
and contingent non-habituability in the native has been
mistaken by some writers for a complete unsusceptibility;
and they have accordingly told us that an attack of yellow
fever, like that of small pox, confers future immunity.
But this is perfectly dis proved by fact; and yellow fever like
its kindred miasmatic diseases, intermittent and remittent, is
known to attack the same individual repeatedly, and must attack
whenever he is exposed to the agency of those circumstances whose
concourse is a sine qua non to its epidemic prevalence.
An attack of yellow fever confers no more immunity

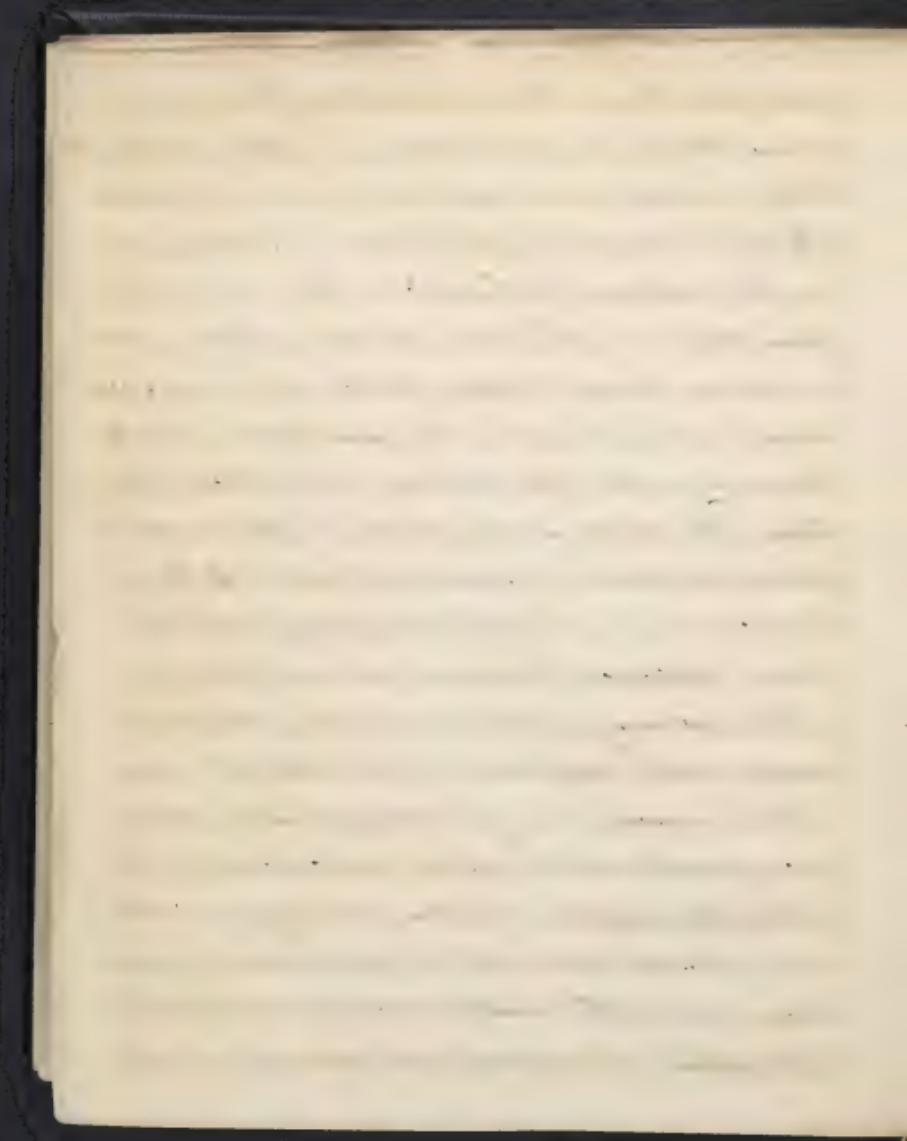
on the system than an attack of intermittent. It contains nothing specific; it is quite ordinary. The relative susceptibility is a mere circumstance; consisting only in the reduction of the high, inflammatory diathermy common to all those who are full of vigour and health, and to be attained as completely by an attack of any other disease, or a course of debilitating remedies, or by exposure to any debilitating operation, as by having gone through a fit of yellow fever. The reason therefore is perfectly obvious why a native of the West Indies is rarely attacked by this disease. His climate is nearly uniform; he feels no severity of winter to induce in his system a phlogistic disposition, and thereby create in him a state of susceptibility; which the ordinary intertropical temperature of summer cooperating with the ordinary quality and concentration of marsh miasma, would be sufficient to elevate into yellow fever.

But in seasons of unaccustomed intensity of heat, he stands as one unacclimated. His system, unaccustomed to such a temperature suffers a reduction of tonicity, and a derangement of function, which, with the contemporaneous augmentation in power of the latent or noxious agents with which the atmosphere is then supersaturated, expose him, though in

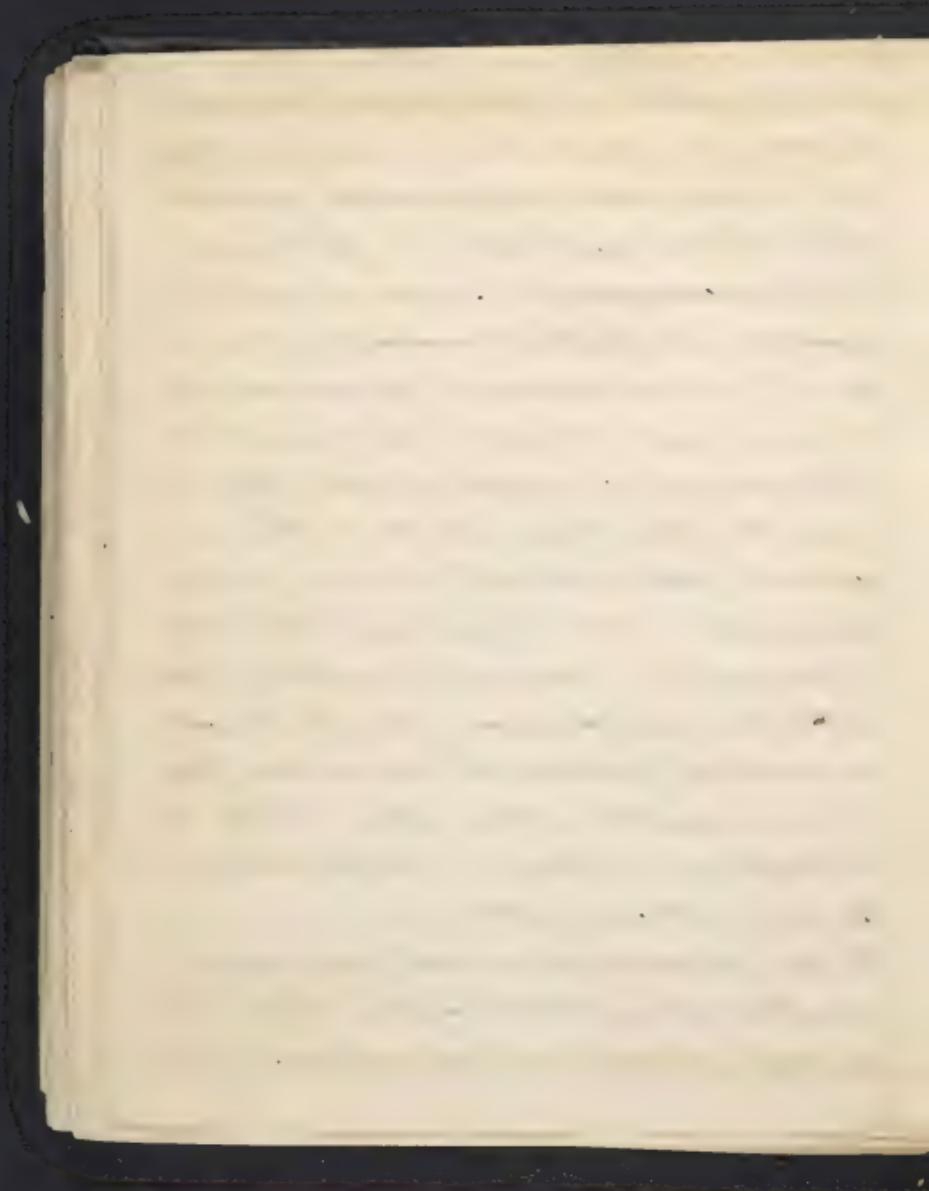


a less degree than the foreigner, to their malignant influence. 31

In such seasons, and in such alone is yellow fever epidemic between the tropics. At other times, the natives suffer only the milder gradations of malarial disease, as intermitents and remittents, according as they inhabit the airy elevation or the ill-ventilated base-town, the healthful country or the marshy city. But when yellow fever is epidemic, those, who suffered the disease upon a former visitation, are - not the less obnoxious to an attack of it on that account, In this respect, it exhibits no partialities; for all the nations share equally its ravages; each contributes to its insatiable voracity, and may help to furnish it a hundred of victims. But as the epidemic visitations of yellow fever in intertropical latitudes are few and far between; much more so than in those beyond the tropics; and as its annual sporadic recurrence among newly arrived foreigners has been confounded with its very rare epidemic appearance among long residents and natives, the exemption of the native in this latter instance has given rise to the hasty and incorrect deduction that the disease conveys a specific immunity on the system; and exonerates it for ever from future

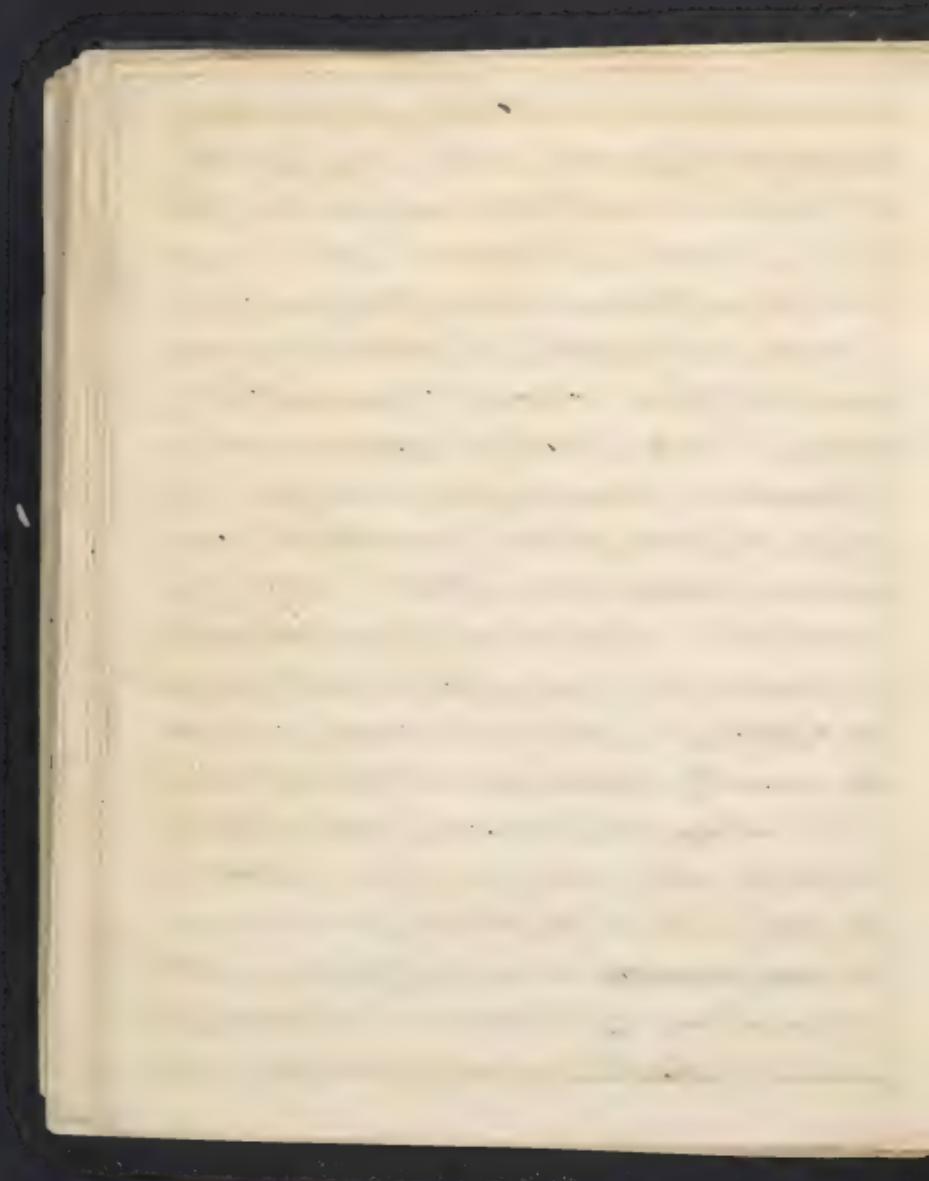


lability to an attack. But all the medical historians who have seen and recorded more than one yellow fever epidemic have not failed to adduce numerous examples of subsequent attacks; thus disproving the truth of the gratuitous assertion of a specific unsusceptibility. As we advance gradually towards the north, the winters increase in coldness, whilst the heats of summer diminish in a far smaller ratio: the annual range of temperature is therefore greater, till, when we arrive in our middle and eastern States, it is augmented to 80 or 90 degrees. Thus our northern years combine the extremes, elsewhere unknown, of a noisy tropical summer with a hyperborean winter. This intermixture of cold renews the susceptibility which had ~~been~~ been much diminished during the preceding summer, and will forever prevent our inhabitants from becoming assimilated in these northern latitudes. A Philadelphian or Bostonian is therefore always liable, who may be attacked by yellow fever every year of his life, just as he and the West-Indian may be by intermittent or remittent; the system is ready for it, and nothing is wanted save the application of the



nocent power. Whoever deliberates upon these facts - I
may answer many questions and solve many difficulties
that have been inconsiderately raised upon this subject.

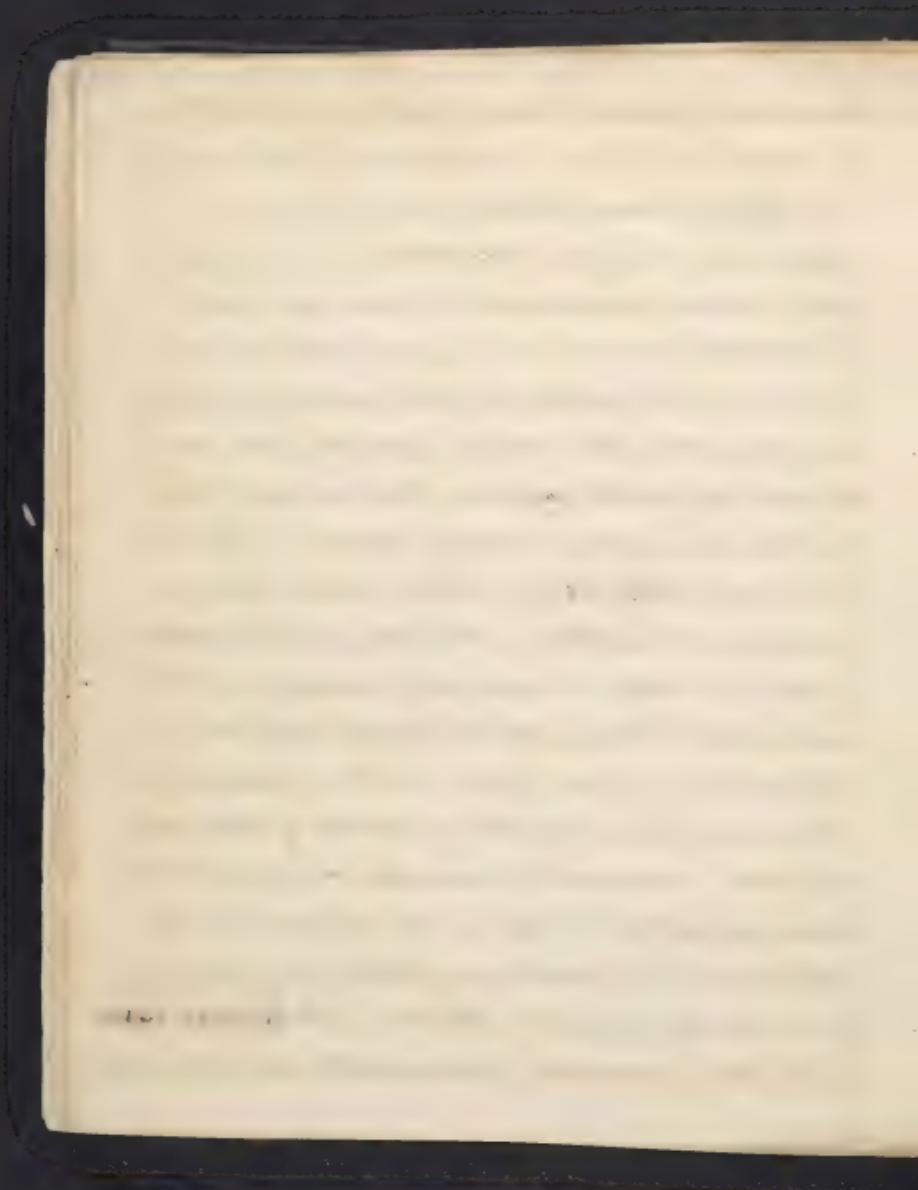
We will no longer place yellow fever and
small pox on the same footing with regard to the
influence of susceptibility; but whilst he looks upon
one as strictly and exclusively communicated by
contagion under all states of the system and all degrees
of disposition, and also as confessing a specific immu-
nity for the future, in will regard the other as an
epidemic disease, governed, like other epidemics,
ascertained and uniform laws; a very high gradation
of miasmatic fever requiring, for its existence, a great
concentration of the noxious power operating on a sys-
tem unusually predisposed, and therefore unaccima-
ted; and always equally a seasoning fever whether it
attack the native of the tropics or the inhabitant of
the North. As, from the coldness of our winters, we
are ~~more~~ frequently always highly predisposed, it will
at once be seen why the disease is more frequently epi-
demic in ultra than in inter-tropical latitudes, and



as strangers are continually flowing, with all their 33
northern susceptibility, into tropical regions where
the temperature is every year sufficient to engender
miasma & of the concentration requisite for yellow
fever under such a state of predisposition, though not
in the nature, it will be as easily discovered why it is
much more frequently operative in the latter than in
the former. The same facts satisfactorily explain why
a visit to the West Indies during the sickly season is more
hazardous to the North American or European than
are to the East Indies or the sea ports on the Pacific Ocean.
In the former case, he is suddenly precipitated, after a
few weeks sail from his native shores, ~~utterly~~ with all
his health, and susceptibility into a tropical climate
and upon a region ripe in the seeds of disease; whilst
in the latter, the introduction is gradual and allows the
constitution, during a long voyage through hot latitudes,
to divest itself of a considerable share of its original
freshness and disposition by a sojourn inclement to the
temperatures of the place of destination, and thereby acquire
a partial pre-approximation. Having now mentioned

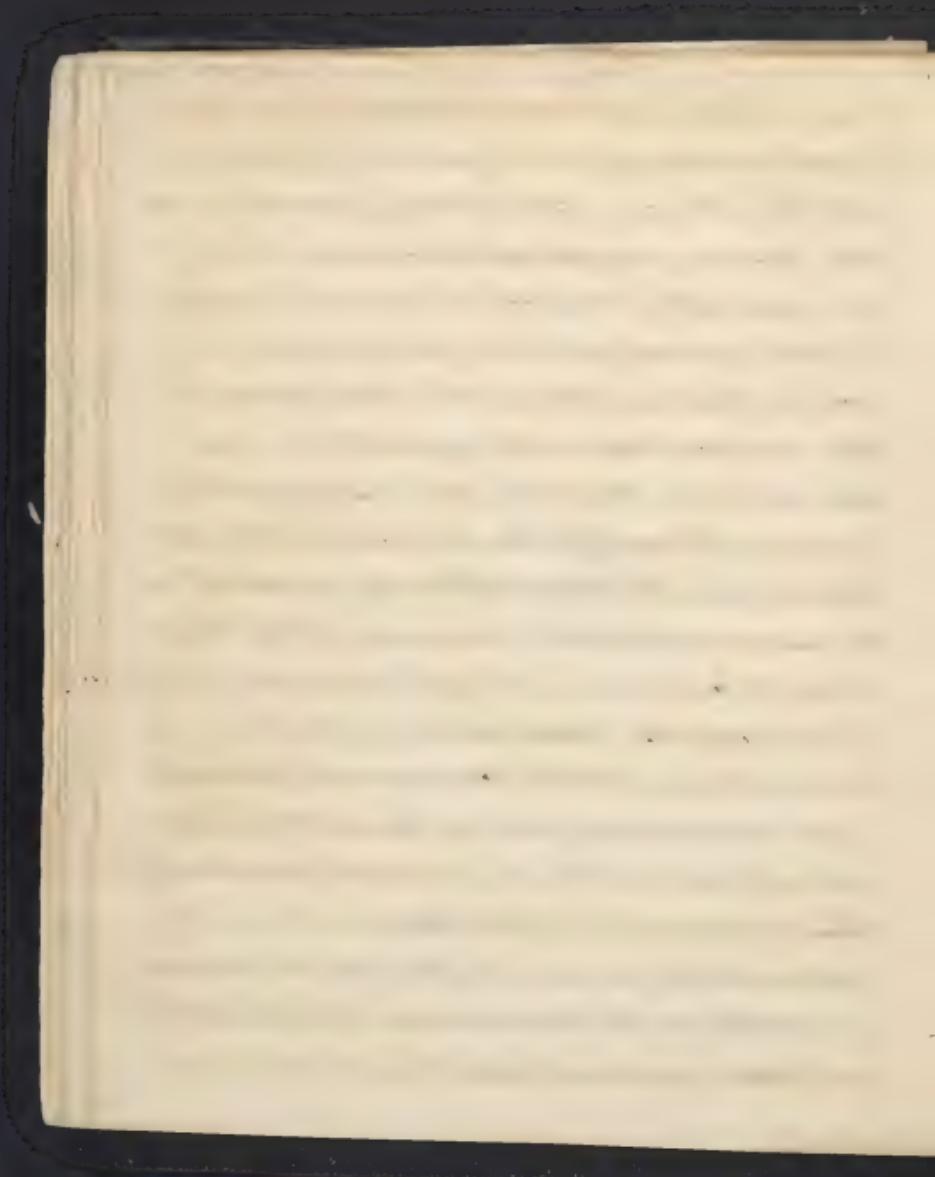
the nature of assimilation and its influence over both 34
the sporadic and epidemic prevalence of yellow fever, I
will take the present opportunity in anticipation of its
proper place, though in order to avoid the necessity of
again alluding to this subject, to draw an argument,
legitimately deduced from it, in favor of the non-contagion
of yellow fever. This disease has been erroneously supposed
to be imported by new-comers, because they are generally
the first and greatest sufferers. But in order to show
that this circumstance is entirely referrible to their un-
assimilation, that ~~that~~ ^{on the principle} I have en-
deavored to illustrate, and that the infectious atmos-
phere of the place is comparatively innocuous to the
natives from habit, whilst it is highly deleterious to the
stranger coming from a pure air to a foreign climate,
it has been observed that the importation of those who
have been accustom'd to a similar or a worse atmos-
phere is perfectly harmless and never followed by the
appearance of the disease among them, ^{is in point} the exception
of the Spanish refugees in Phila in 1793 ~~in~~

The same is remarked by Humboldt, who tell us that

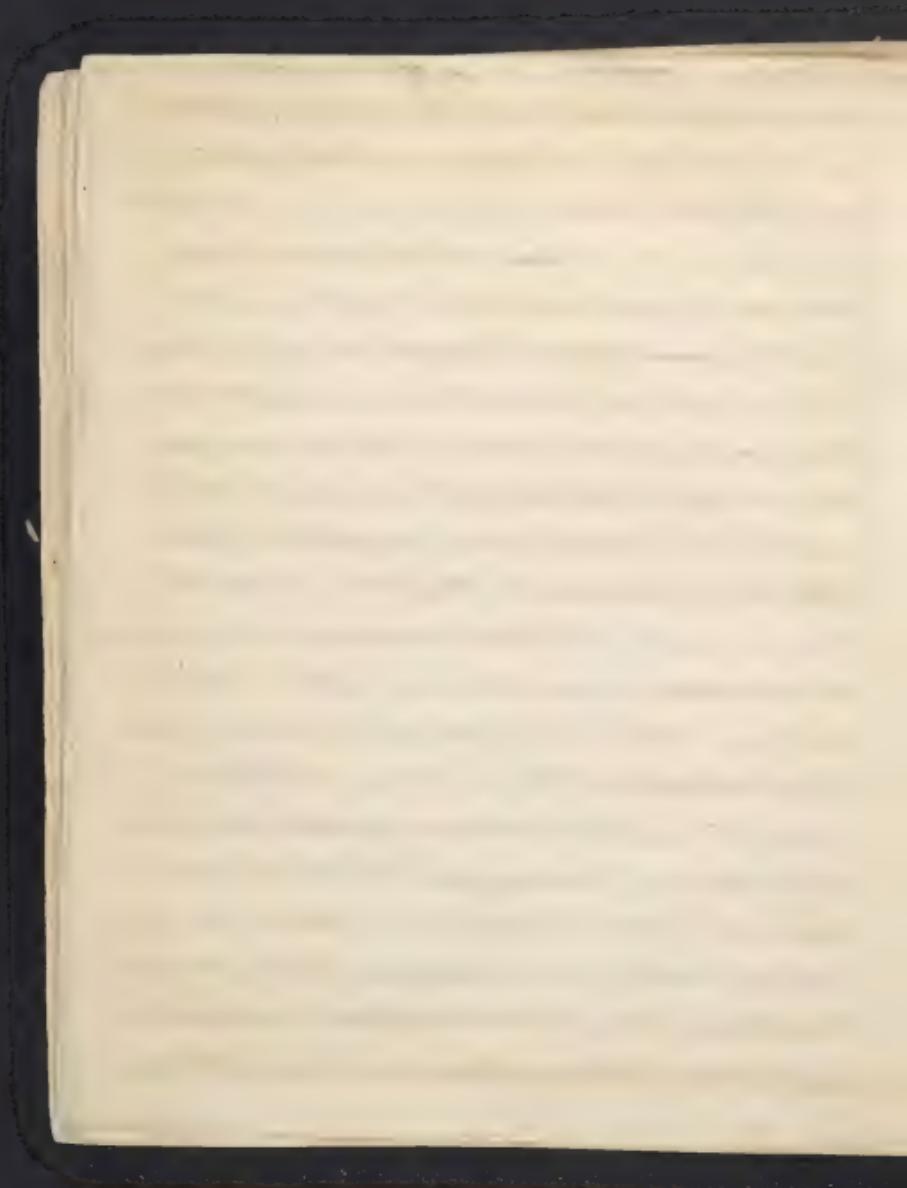


the yellow fever is unknown at Acapulco, where the temperature varies only 2 or 3 degrees during the year, and adds that, if this port, instead of being frequented by ships from Manilla, Guayaquil, and other places of the torrid zone, were visited by those from the pure air of Chili, from the north west coast of America, from Europe, or even from the Highlands of Mexico, the bilious fever of the place would soon appear in the aggravated form of yellow fever and terminate itself with fatal malignity. In times of peace and tranquility, when the arrivals in the West Indies are few, this disease appears very sporadically, and the cases are proportionate to the number of new comers.

But let a war arise, and great multitudes of Europeans be landed upon those Islands, particularly if the time of their arrival corresponds with the commencement of the sickly season, a considerable portion of them will be seized with yellow fever within the few ensuing months, although there exist not a case of this disease in the whole West Indian Archipelago. The numbers would be increased in proportion as the strangers arrived from the purest and coldest regions in Europe, where yellow fever



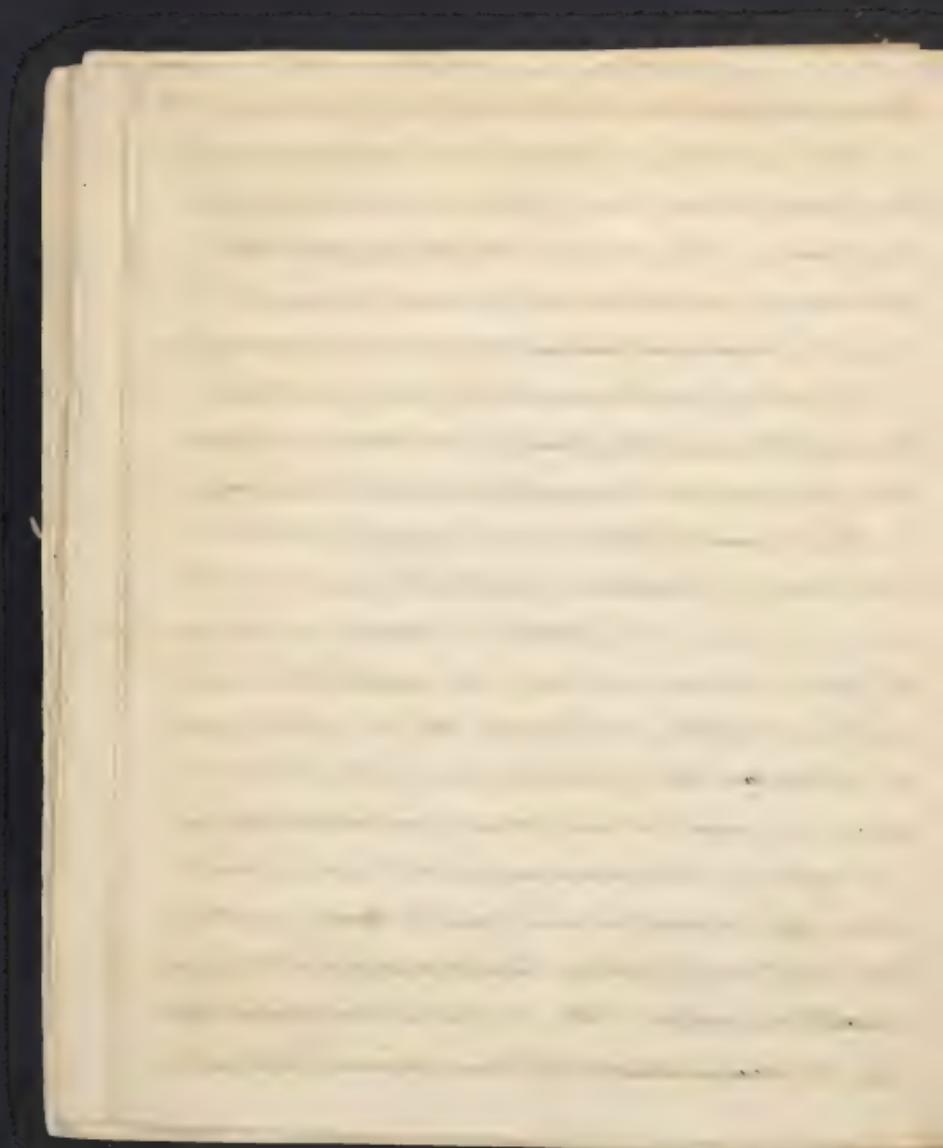
never has appeared, and consequently where the impossibility of the expectation of its contagion would be infinitely great. This would occur every year during the continuance of the war, and would cease with its cessation; though yellow fever may not have made its appearance there for many years before. These facts are perfectly explainable by a reference to the influence of susceptibility on the principles pointed out, and it is therefore unnecessary and unphilosophical to call in the agency of a second power, whose laws and phenomena are altogether inconceivable and at variance with those which govern the disease in question. It is a circumstance, both singular and unprecedent, observes Dr. Pinckney, that an active and spreading contagion, prevailing in any particular country, should expressly avoid the inhabitants of that country, and only lie in wait for strangers, and should have not chance to arrive for many years, that this insidious course should pass throughout the whole period, and again rush forth with undiminished vigour, the very moment that strangers appear. Can it be supposed, he adds, that a most subtle and active contagion would remain latent,



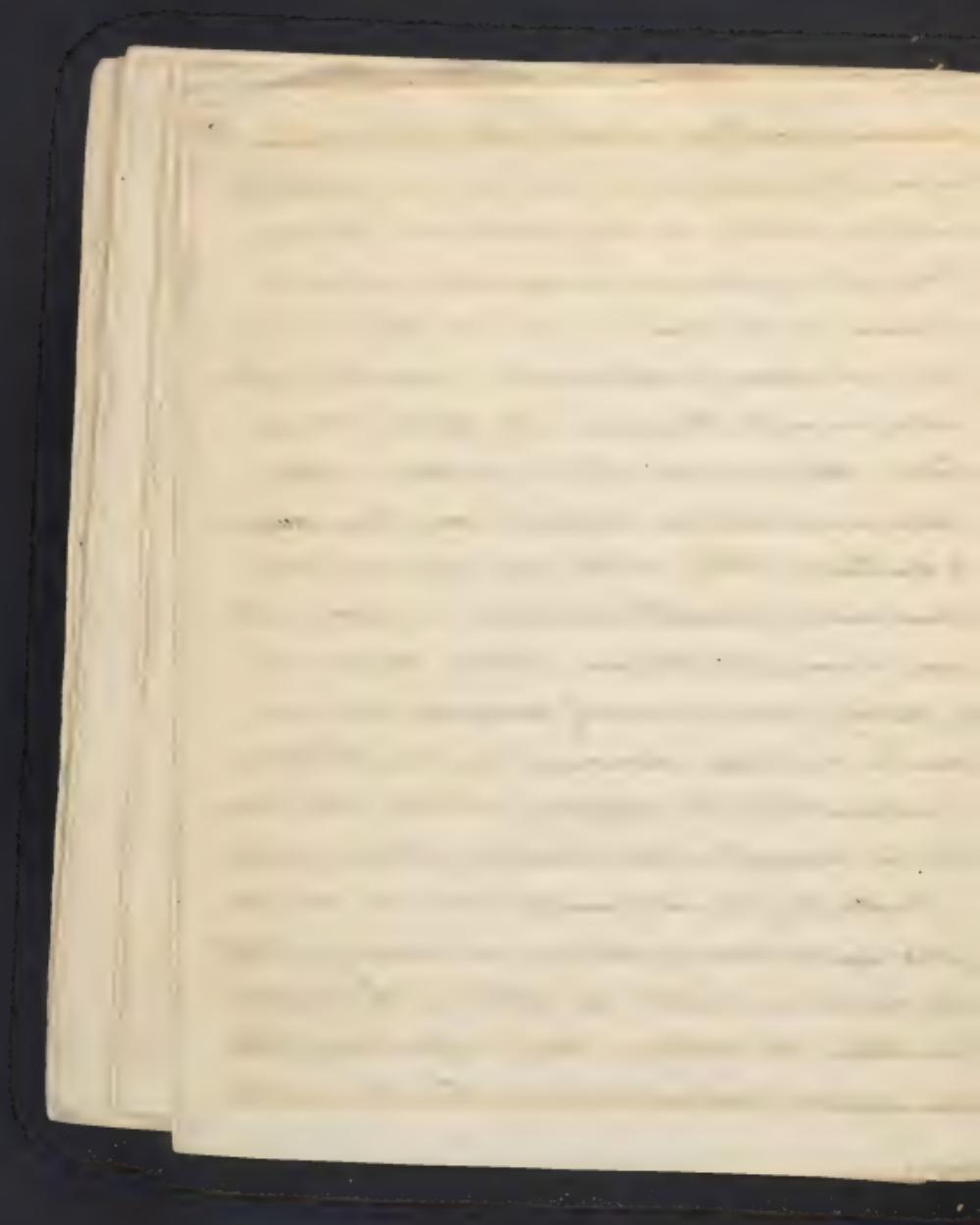
for any specified term, amidst whole hordes of natives, and 37
truly and as it were, impudently resume all its destructive
like powers, as soon as a body of more robust foreigners
should come within its reach? In this respect, yellow-
fever exactly resembles all other diseases of misomatic
origin, and universally acknowledged to be non-contagious.

The natives of misomatic districts are less anxious
to marsh diseases than foreigners who occasionally visit
them, but not so to those that are certainly contagious.

The march of yellow fever is directly in the line
of the scale of assimilation. A West Indian, residing
for a few years in the North, and acquiring a sanguine,
phlegmatic disposition, will lose his conditional suscep-
tibility, and return to his native country with a system
as exposed as that of the European, to the invasions of
a malady which it had formerly confronted with poor
but impunity. The same negro, who under a West
Indian sky, is nearly secure from the disease, gradually
loses that security as we travel Northward, till, in the
middle and eastern states, he is but a few degrees safer
than the cohabitants of the same regions. With a

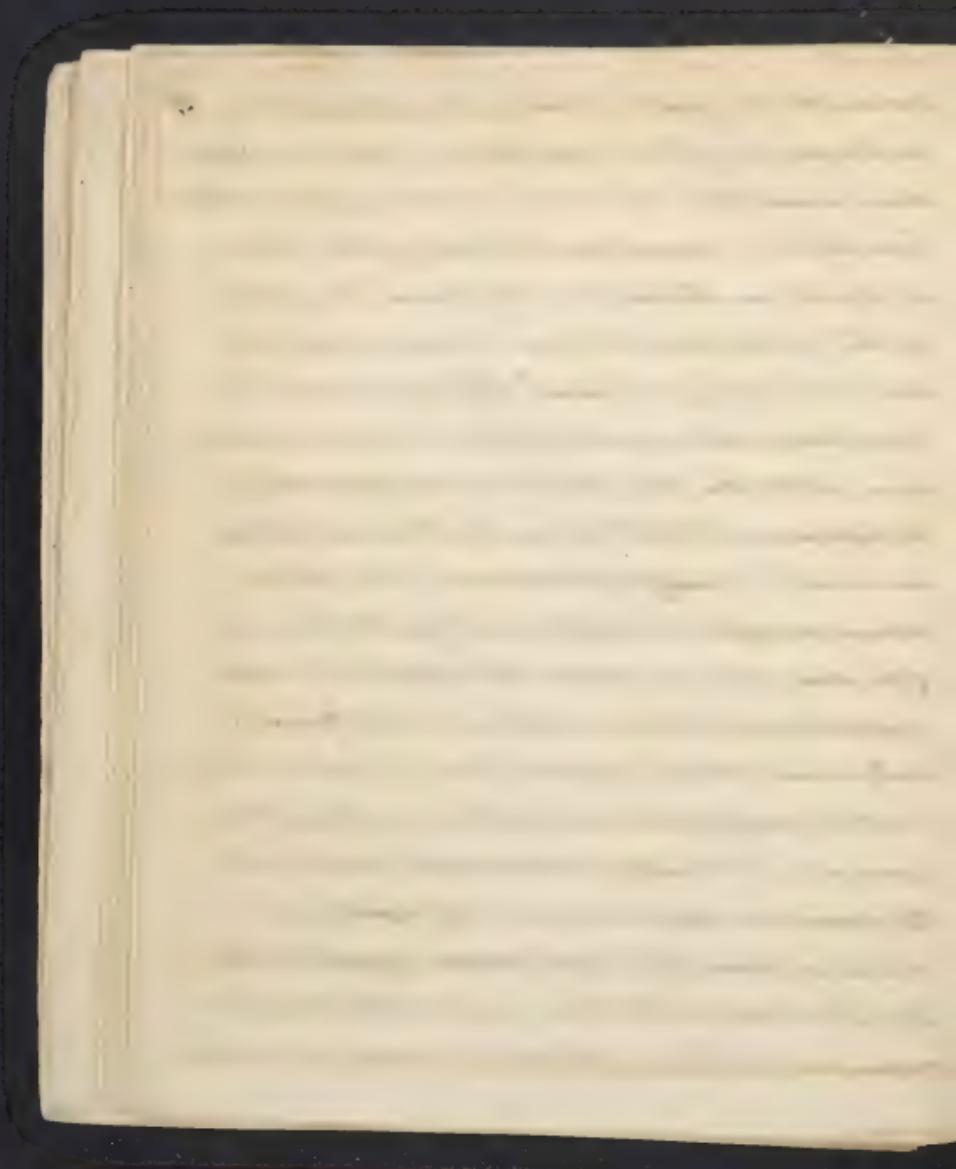


remarkable exactness of selection, yellow fever manifests 98 a peculiar partiality for the robust, the vigorous and the healthful. As has been truly declared, it is the disease of manhood, of the excited, un assimilated, full habit. It more rarely attacks an earlier or later period of life; and seldom females, or only in proportion, as from intemperance or other causes, they approach to the habit of the male sex; while old residents, whether native or assimilated, and people of colour, though subject to remittents and other milder forms, may be said to be almost entirely exempted from this severe form of disease. Such partialities are not to be discovered in the history of diseases avowedly contagious; they run counter to all these phenomena and laws. Contagion is independent of any accompanying; it is the entire cause; the tout ensemble in the production of its own disease. It admits of no interference; not is the so-called antipathetic agent, scorning assistance, and crushing of itself all opposition. No state of the system, no hardness of constitution, no weakness, laxity, or effeminacy of fibre can retard or accelerate its attack. The native and the

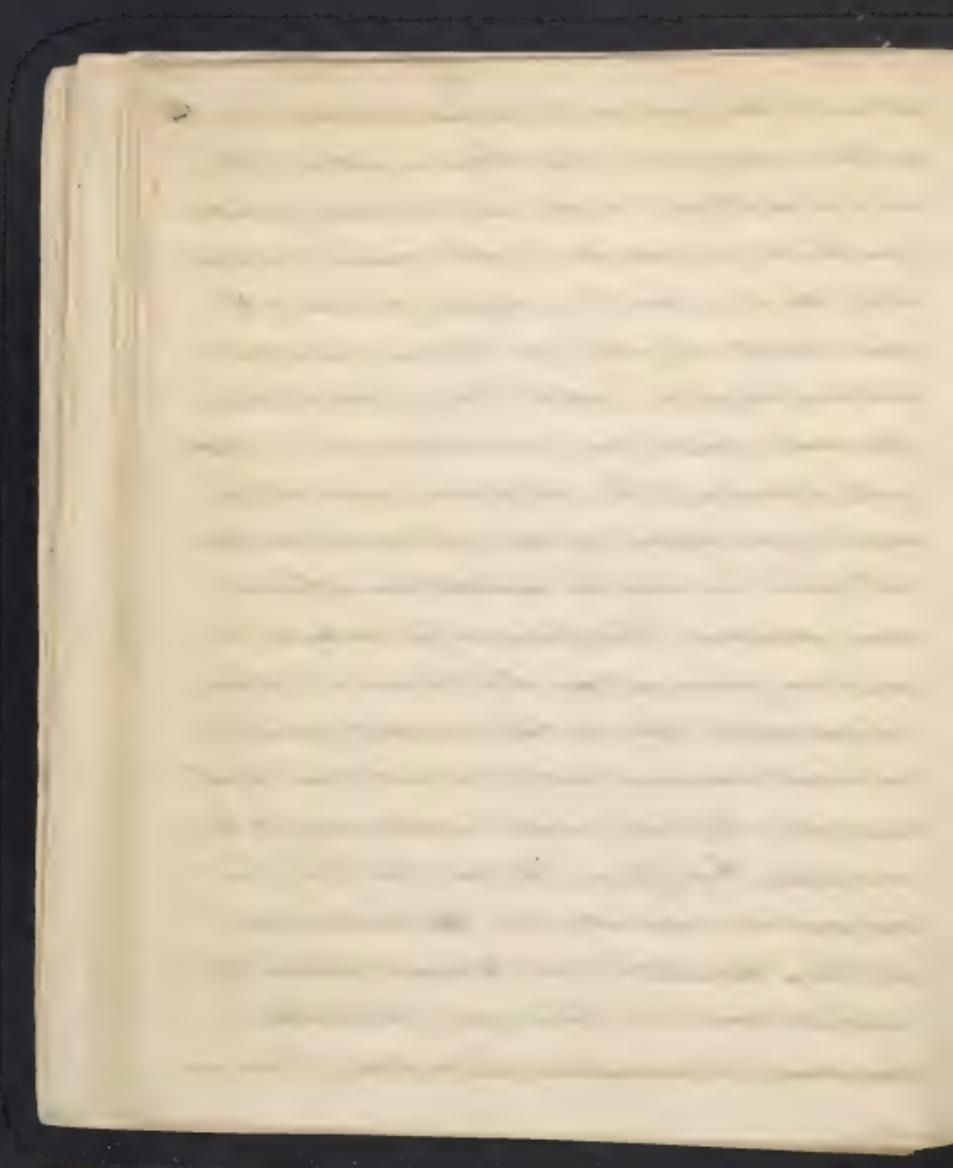


foreigner; the old and the young; the robust and the 39
infirm; the male and the female are alike its ready
and indiscriminate victims. As additional evidence
both of the miasmatic origin of yellow fever and of its
independence on a contagious principle, I will mention
some of the grounds which establish its identity of nature
with miasmal diseases. It is an error in science,
leading to the admission of Relative opinions to derive
its nomenclature from circumstances or partial views
of the subject. Its effects have been remarkably conspic-
uous in the particular disease under consideration. It
has been invested by different nations and writers with
a variety of names, drawn from what each consid-
ered the ruling or predominant symptom. Savage
has discovered in it sufficient to entitle it to the denom-
ination of *typhus icterodes*, thereby indicating it to be
a compound of jaundice- and typhus fever. Cullen has
somewhat modified the name, and has substituted, for the
icterodes of Savage the epithet of "cum *flavidae cutis*";
from the yellow-colour so often the concomitant of this
disease. The Spaniards call it *bonito* *negro* or black

vomit, from a symptom which, as it is generally the 4th harbinger of a fatal termination, is of very rare occurrence among those who survive an attack. Some authors have styled it Causus from the burning heat which is so frequent an attendant; and the French have given it the title of Maladie de Siam, because towards the end of 17th Century, a French ship of war arrived at Martinique, with a number of French emigrants from Siam, about the time that this Disease was making its appearance at that Island. The concurrence of these two events was sufficient evidence of their relation as cause and effect to invest the malady with the name of the place where it was said to be exported, the name of yellow fever, by which most English and American writers have called it, is derived from a symptom which is not only very often wanting but is of frequent occurrence in intermittent and remittent fevers. I make this remark in order to扫 away all prejudice and malign influence that might accrue against the identity of this disease with those of acknowledged misnomer origin, and in favour of its specific, unconnected, isolated

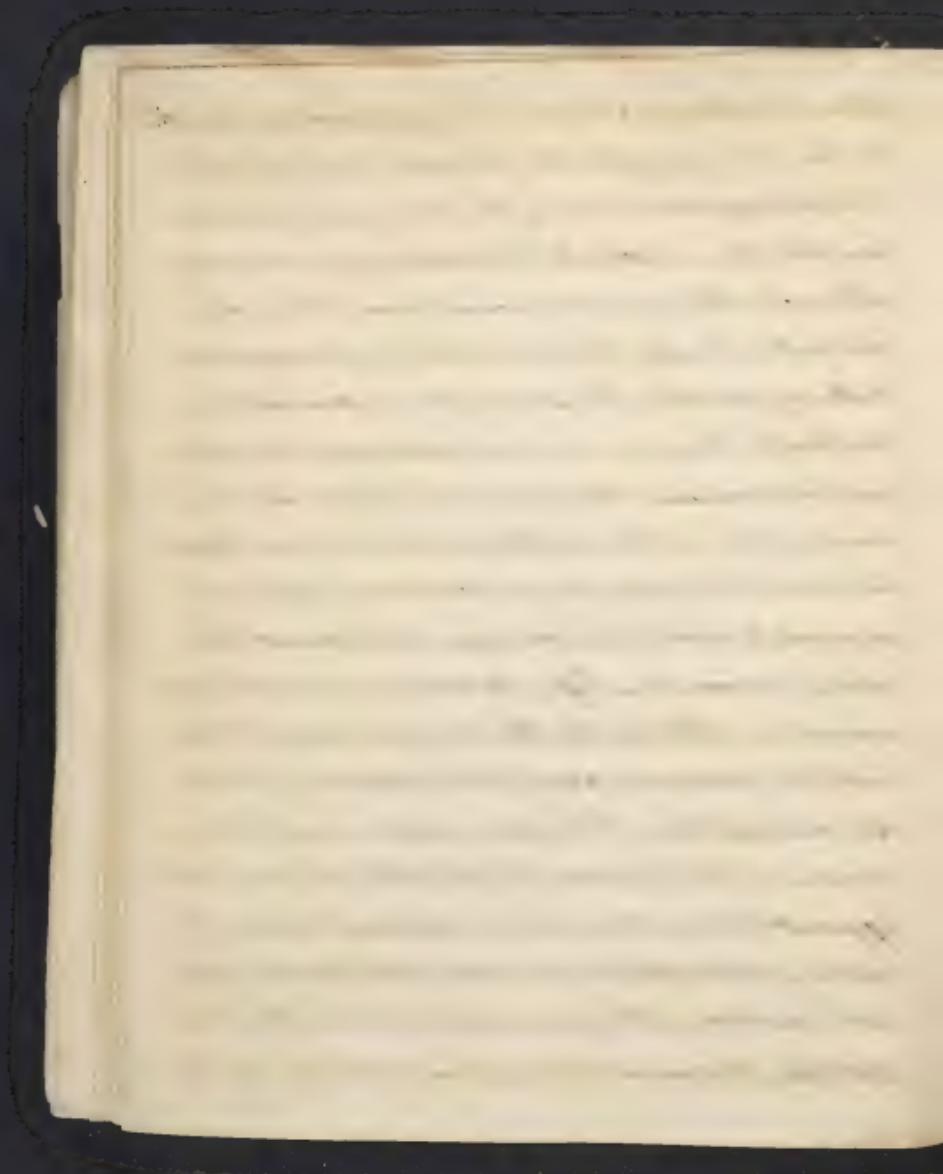


nature. If these facts are kept in view, we shall be enabled to enter on the subject before us with no particular bias, or obliquity towards error. The identity of nature of intermittent and remittent fevers is generally acknowledged; they are believed to be different gradations of the same malady, originating from the same cause, and spreading throughout a district of country, not by contagious communication from individual to individual, but by the application, to the body of every person who is infected, of an efficient quantity of the marsh miasma with which the atmosphere is loaded during their epidemic prevalence. This opinion is founded on an accumulation of circumstances, which renders the contrary belief impossible. They are both indisputably proved by an infinite number of facts to originate from marsh miasma; they both prevail simultaneously at the same place; they appear in the same year; though in one year, one predominates; and in the another year, the other. Remittent is found to prevail whenever the miasma exist in a higher degree of concentration in consequence of the circumstances and conditions. I have so

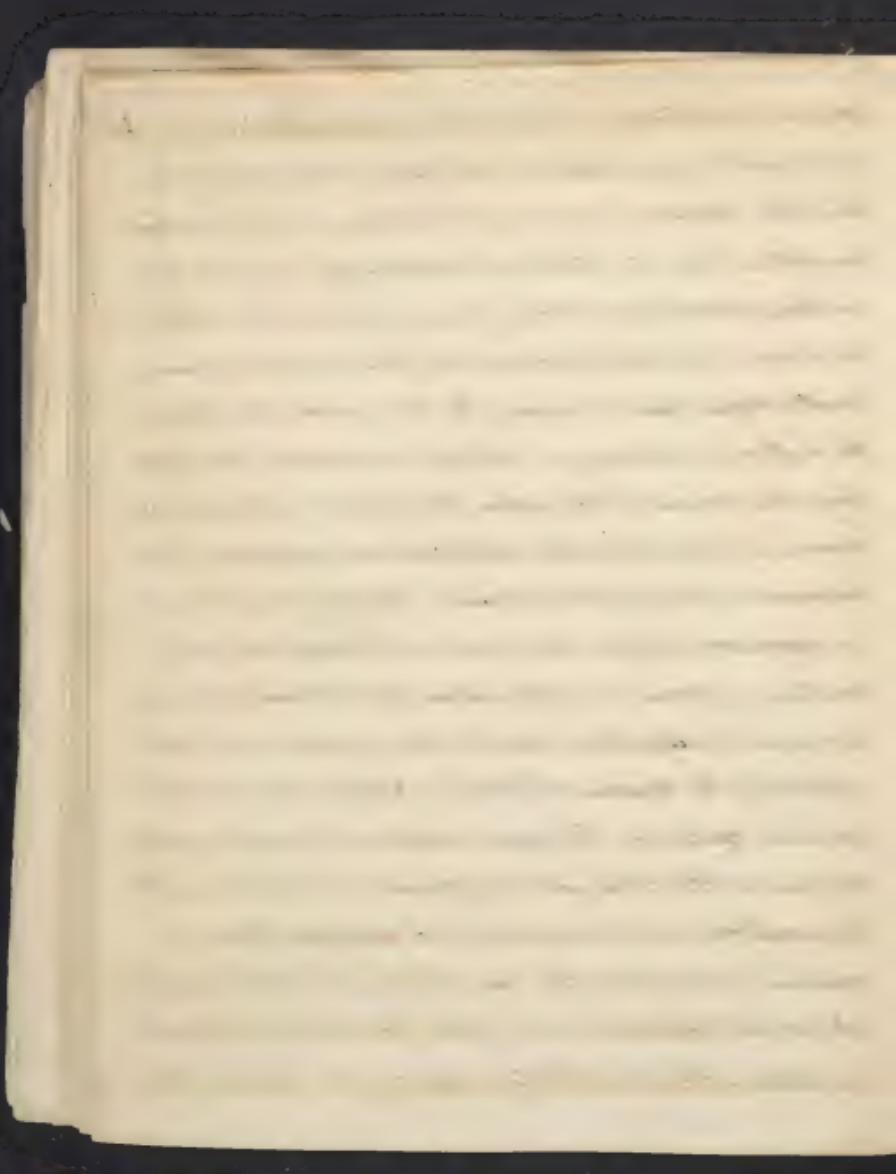


often indicates, and when the bodily predisposition is great⁴²
so there is necessary for the extraction of intermittent.

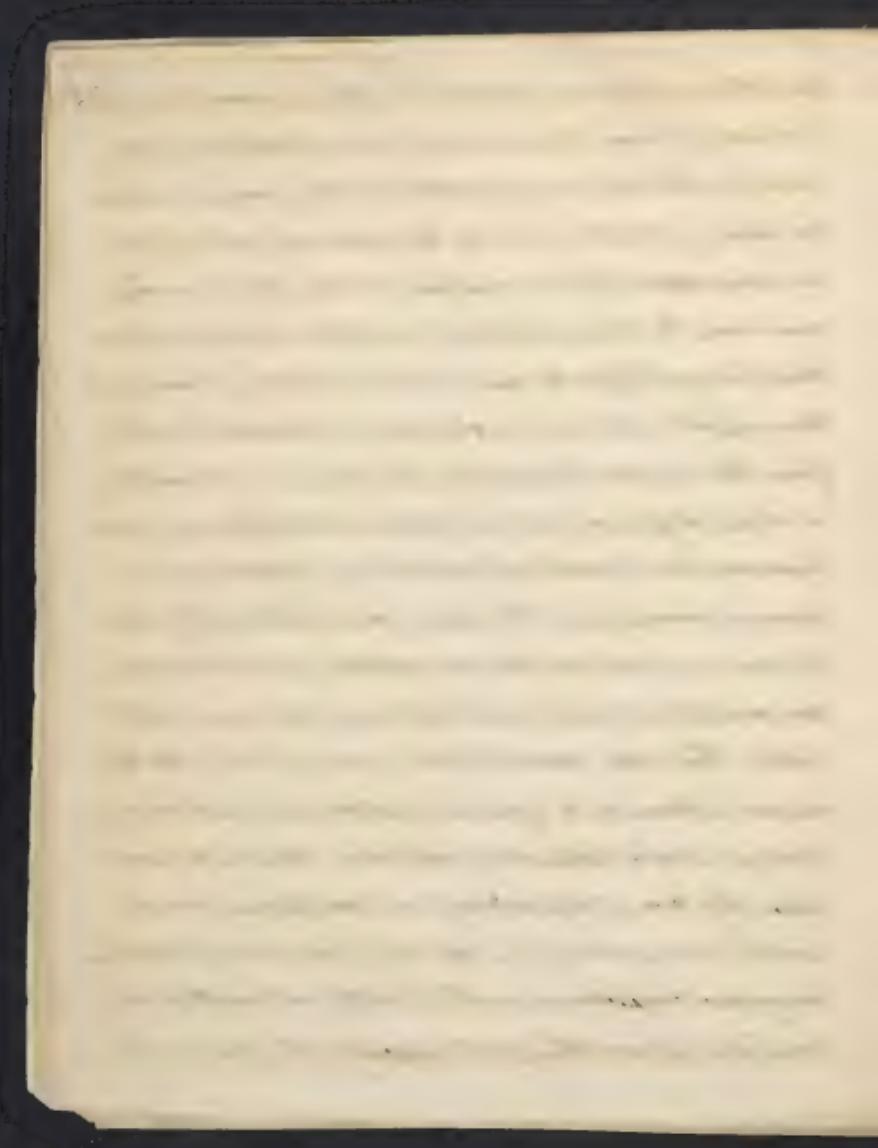
They always prevail during the same season, which has
been already pointed out. They also suffer convulsions
into each other under circumstances, previously
indicated. Finally, they are both of a paroxysmal
tendency, exacting the same general principles of
treatment. These circumstances, with many others that
might be mentioned, have induced the belief that they
are the same in their nature and differ only in degree;
the force of the cause being, in one case, sufficiently
moderate to enable each paroxysm to terminate com-
pletely for some time before the commencement of the sub-
sequent one; whilst, in the other, it is great enough to pro-
tract the paroxysms nearly to the beginning of those
that succeed them. Of the same nature are the cir-
cumstances that induce the belief that the cause, which
aggravated to a certain extent, produces remittent fever
instead of intermittent, will when still further aggra-
vated, produce yellow fever instead of remittent; and
that these diseases are one in kind, and vary only in



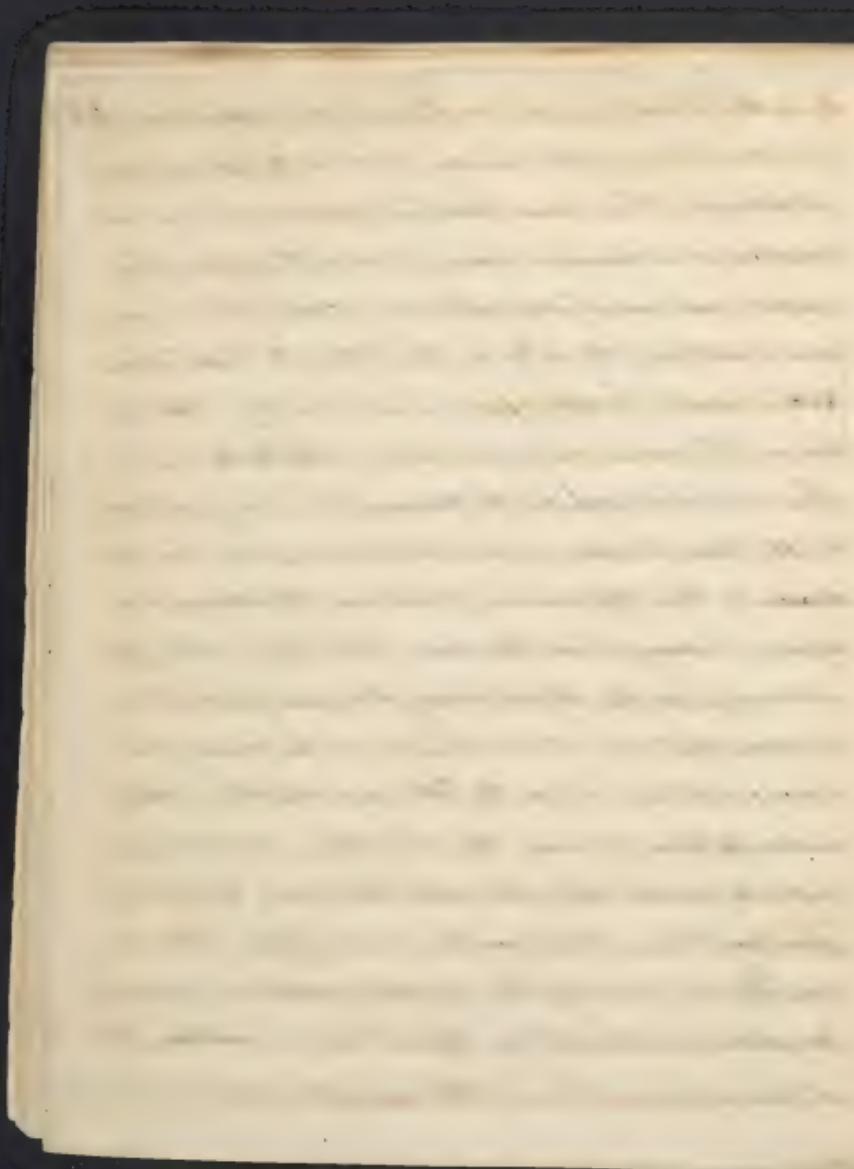
respect of intensity. I have already indicated the local 43
ity of yellow fever, which in this respect coincides with
the other miasmal diseases. It is believed to be of a higher
gradation than the others, and accordingly is found only
in those places and at those times in which, I have shown,
the same cause that produced the latter exists in a much
greater degree than is necessary for their production. Whilst
the heats are increasing in intensity and duration, and before
they have arrived at the yellow fever point, remittent is epi-
demic. As the temperature still continues and rises, the fever
increases in malignity and violence, till many cases are of
so aggravated a degree as to induce the suspicion of the
existence of yellow fever. The nature of the disease becomes
a subject of discussion; some declaring it to be the ordina-
ry fever of the season, whilst others contend that it is the
tropical epidemic. The cause continues to rise in inten-
sity and with it the fever augments in violence; all
the symptoms come more nearly to resemble those of
genuine yellow fever, the cases become more numerous,
till at last all acknowledge yellow fever to be the prevail-
ing disease - So remarkably is this sometimes the case that



the college of physicians of Phil^a in their answer to the 44
governor of Penn^s respecting the yellow fever which, &c.
existed in that city in 1797, state, as their principle reason
for believing that the fever of that year was not the ordinary
remittent, "that a malignant remittent fever has
never been, to their knowledge, contagious in this climate,"
thus being obliged to resort to the creation of a nonentity
to support a distinction that did not exist. In cities,
from their higher temperature, the disease will rise to
a higher degree of malignity than in the adjoining coun-
try or even in the suburbs, and hence whilst yellow
fever is prevailing in the former, and particularly where
the sources of miasmate are most concentrated, the mil-
ler gradations of fever will be found epidemic in the
latter. This is the case in those years in which the heats
are so intense as to aggravate yellow fever into a very
malignant and destructive epidemic. But in seasons
when they are of less intensity, and this disease prevails
but in a small degree in the city, there will be contam-
inary and co-epidemic with it both intermittent and
remittent fevers. The great majority of the cases will



be of this latter kind; so much so that the existence of 45°
the former during that season will be denied by many
physicians. This simultaneous concurrence and inter-
mixture of ordinary bilious fevers with yellow fever
was so conspicuously exemplified in each of the numer-
ous visitations of the latter in Phil^a, that Dr. Rush has
well dwelt largely upon it in his history of these epi-
demics. The same truths are amply illustrated in Sir
John Pringle's work on the Diseases of the Army. Not only
do all these diseases prevail in the same place, but the
season of their appearance, prevalence, accutancy and
duration is every where the same; for whilst yellow fever
is prevailing in the city and among strangers, intermittent
and remittent are at their height in the country and
among natives; but as the latter are capable of existing
under less force of cause than the former, they always
begin to prevail before the heat has risen to the yellow
fever point, and continue after it has fallen below it;
never ^{less} the period of their greatest prevalence is the same,
for yellow fever has always appeared in our northern cities
at that season, when, in other years, the ordinary miasmal



diseases were most rife and malignant. The fact, which 46
places the identity of all these diseases on the firmest foun-
dation, is their conversions into each other by the very cir-
cumstances, we would, *a priori* and from analogy, suppose
capable of producing such an effect, viz. the state of the weather
in the particular mode of treatment, together with exposure
to or removal from the ~~climate~~ a highly miasmatic atmos-
phere.

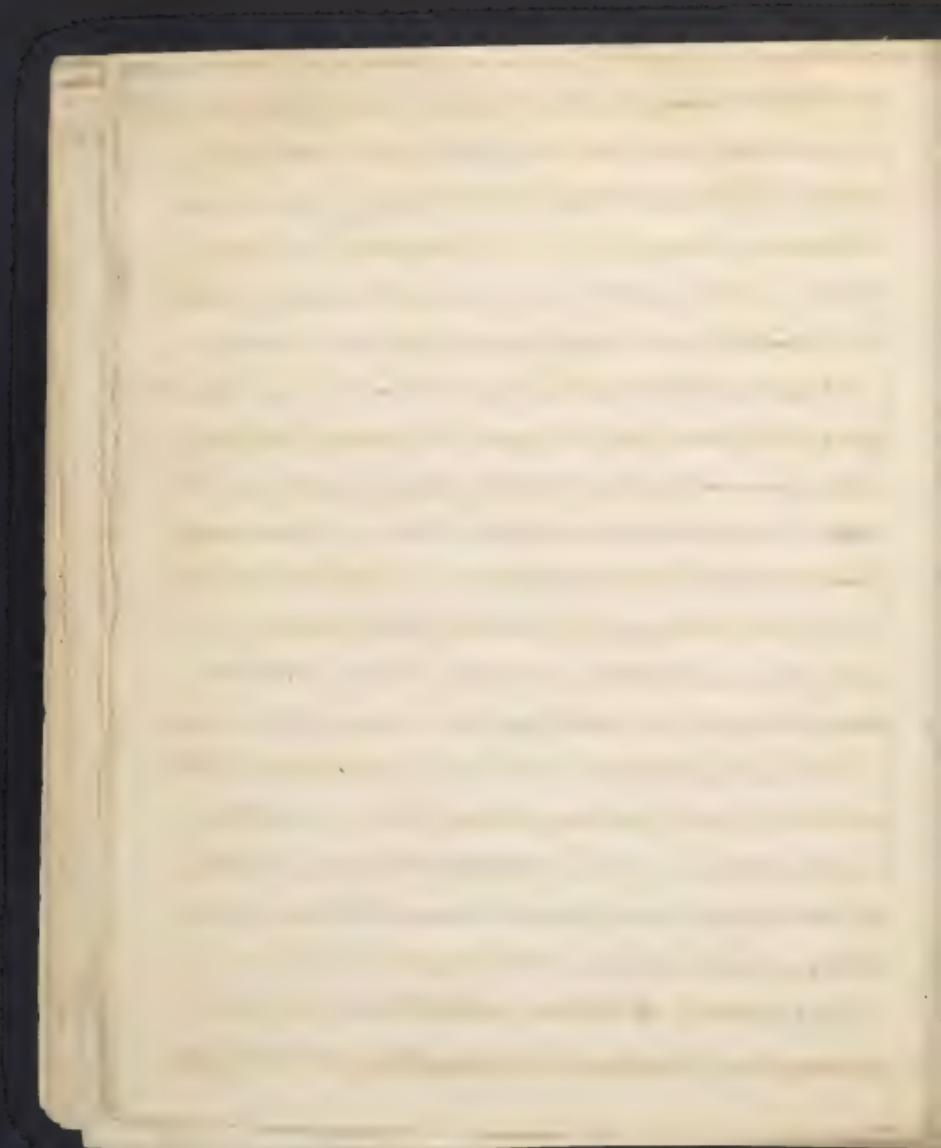
Indeed, yellow fever, particularly when the disease is only
sporadic in consequence of the comparative weakness of the
cause, generally when of a protracted duration, commences
under the mild form of simple intermittent or remittent
leaving it uncertain whether it will continue of this type
or be aggravated to the severer one of yellow fever; and in
its decline, falls again into the mitigated form from which
it originated. Upon this subject there is the highest and
most ample testimony. Sir John Pringle was of this opinion
and has furnished us with facts which fully justify his
~~belief~~ ^{opinion}. He has also given us the testimony of Dr. Buch-
anan in a communication to himself, ~~and~~ who, from his
opportunity for observation in his attendance on the army
in their expeditions to the French and Spanish Islands and

to America, must be admitted as no small authority. 47

"Even in the most ardent and severe kinds of yellow fever," says he, "I think a paroxysm may generally be perceived once in four and twenty hours. And if the yellow fever were to be distinguished, in its beginning, from the common remittent or intermittent fever which was so fatal to our army, it was only by all the symptoms running higher, and by a greater degree of the fever when one might have expected remissions."

After enumerating the violent symptoms of yellow fever, he adds, "I have often seen patients, labouring under most of these symptoms, immediately relieved by early evacuation, and the fever brought to intermit. He concludes, "I am apt to think that these are different degrees of the same disease, and that it sometimes depends upon the manner in which the patient is treated in the beginning, whether he shall have the yellow fever, or only a remittent, or intermittent fever." Lind expresses the same opinion of the community of bilious fevers and of the non-specific nature of yellow fever in the following language.

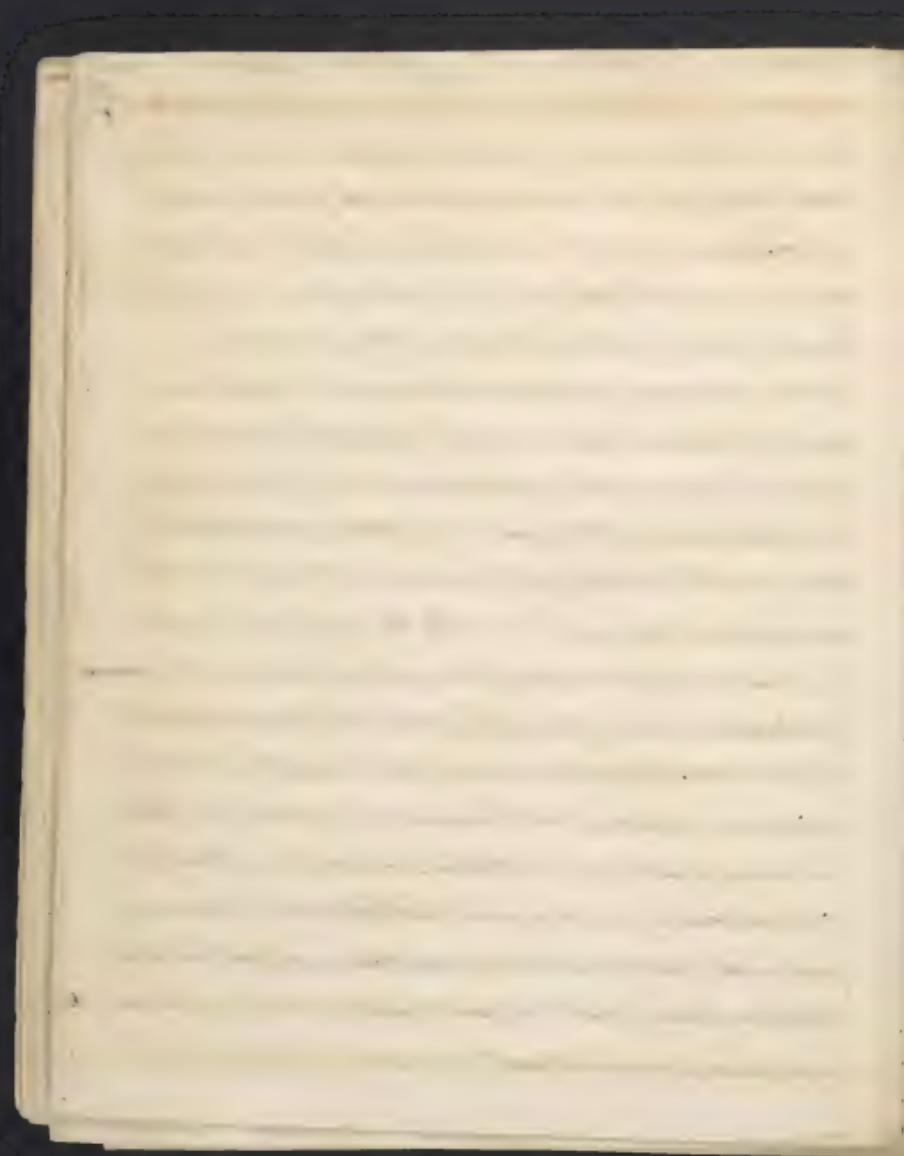
"Having considered this disease with attention, I am now of opinion, that the remarkable dissolution of the blood, the



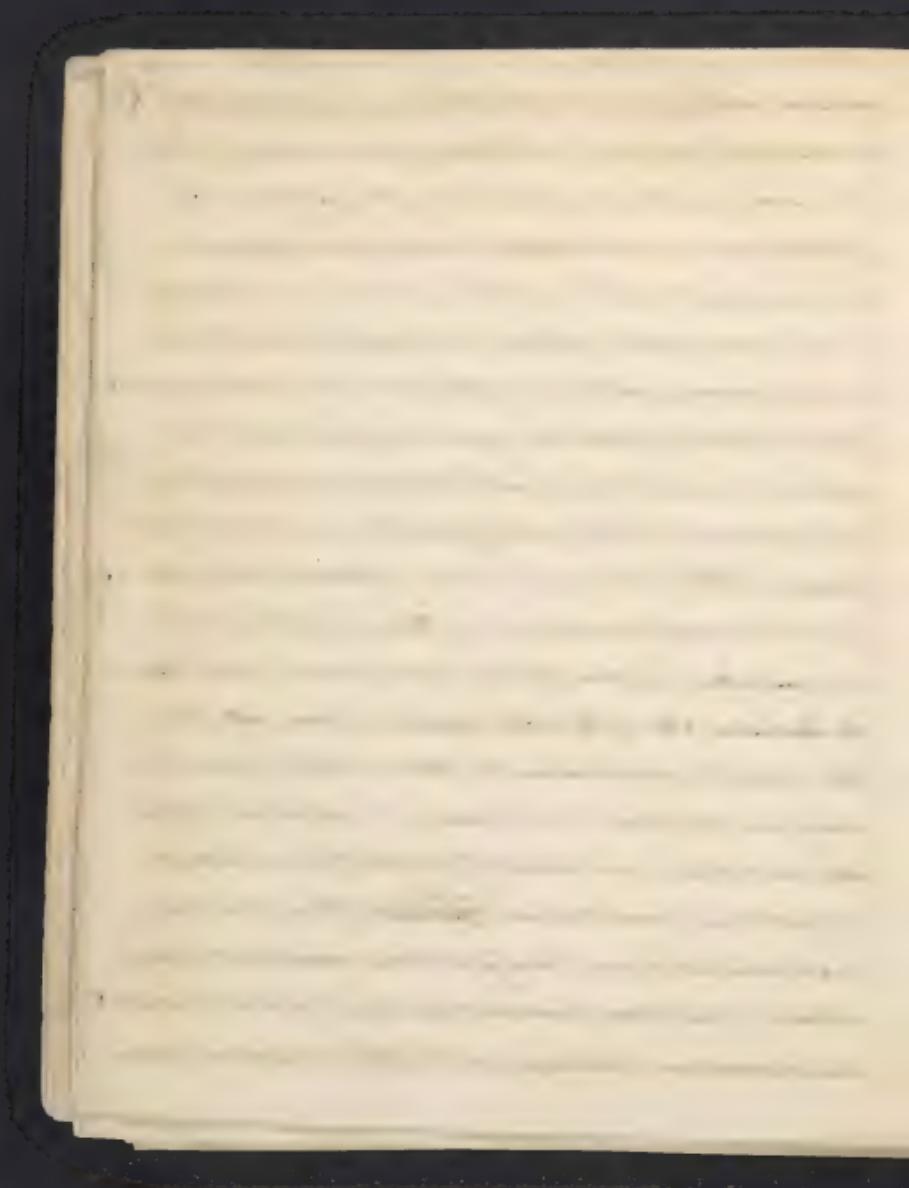
violent hemorrhages, the black vomit, and the other symptoms 48
which characterize the yellow fever, are only occasional appear-
ances in the common fever of the West Indies. They are to be
considered merely adventitious, in the same manner as bloody
stools and bloody urine are in the small pox & as an hiccup
in the dysentery. like these, they only appear when the disease
is accompanied with a high degree of malignity, and there-
fore always indicate great danger." In conformity with this
opinion, he has given us the following decisive fact. He tells
us that, at Greenwich hospital, in Jamaica, "unfortunately
built near a marsh, upon a most unhealthy spot of ground;"
"the effects of this unhealthy situation were, that, when a
patient was sent thither with only a mild intermittent
fever, this mild indisposition was often changed into a malign-
ant fever & the yellow fever often reigned there, attended
with the most profuse evacuations of blood & when no
such symptoms occurred in patients whose cases had been
similar, and who were permitted to remain in their ships."

The aggravation of intermitents to yellow fever under ex-
posure to highly concentrated marsh miasma was not
the consequence of contagion in the hospital, for "these things

happened even when there were a small number of patients 47
in it, and these lodged in the best airing and in the cleaned
work". Dr Rush, who is a strong advocate for the unity of
bilious fevers of whatever type, has provided us with facts
confirmatory of this opinion, of the yellow fever of 1797. He
has observed, "by aspilting remedies, the most malignant
yellow fever may be changed into common bilious fever;
and, by tonic remedies, improperly applied, the common
bilious fever may be made to assume the symptoms of the
most malignant yellow fever". In a letter to Dr Miller, the
same author, speaking of the epidemic of 1802, holds this
unqualified language, "Never has the unity of our auto-
nmal fevers been more clearly demonstrated, than in our present
epidemic. Its four principal gradations, viz. the intermittent,
the mild remittent, the inflammatory bilious fever, and the
malignant yellow fever have all run into each other
in many instances. A tertian has ended in death, with
a black vomiting; and a fever, with the face and eyes suf-
fused with blood has ended in a quotidian, which has yielded
to a few doses of bark". These different gradations of mis-
mal fever sometimes consort so much with each other.

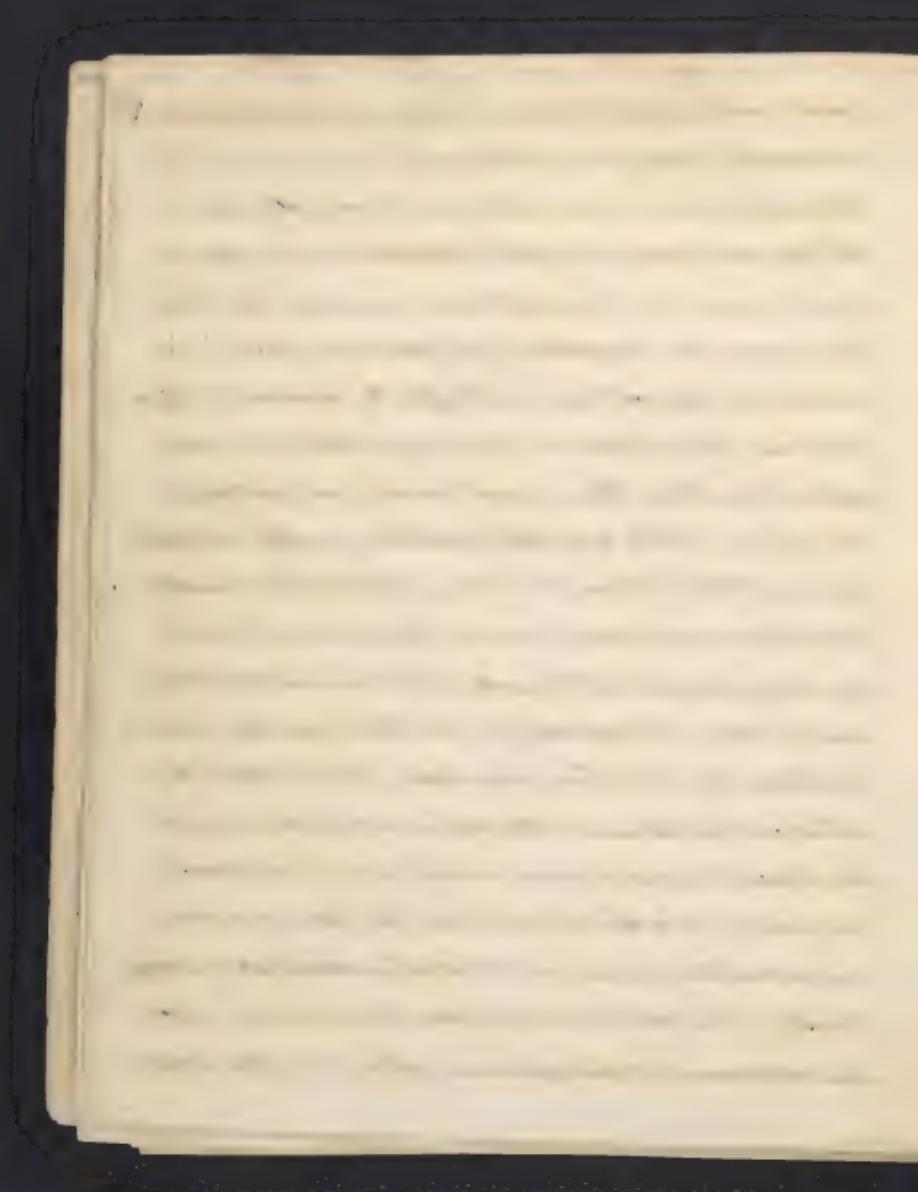


and are so dependent on the same circumstances, as to exist indiscriminately in the same garrison among persons of the same condition as regards every thing save variety of constitutional predisposition, arising from difference of temperament or habit. Of this, we have an example in the fever, which attacked a body of English troops in their garrison at Marigaluth in July 1808, seconded by Dr Dickson of 350 men, 40 were affected with fever, of which disease, "many had the yellow or endemic fever of the Red Indies, in its most aggravated form, with black vomit; in others, it was of a more protracted character, and with symptoms resembling those of typhus; while the remainder had remittent or intermittent fevers. Upon the recession also of the sickly season, we generally find that, unless the superintendence of frost or a fall of rain distinctly put a period to the disease, the yellow fever diminishes in violence, and gradually lets itself down through the gradations of remittent and ~~intermittent~~ till it dies away and is seen no more. Finally, all these varieties are characterized by the same principal symptoms; they are all evidently of a parasitical tendency; and the trifling difference between

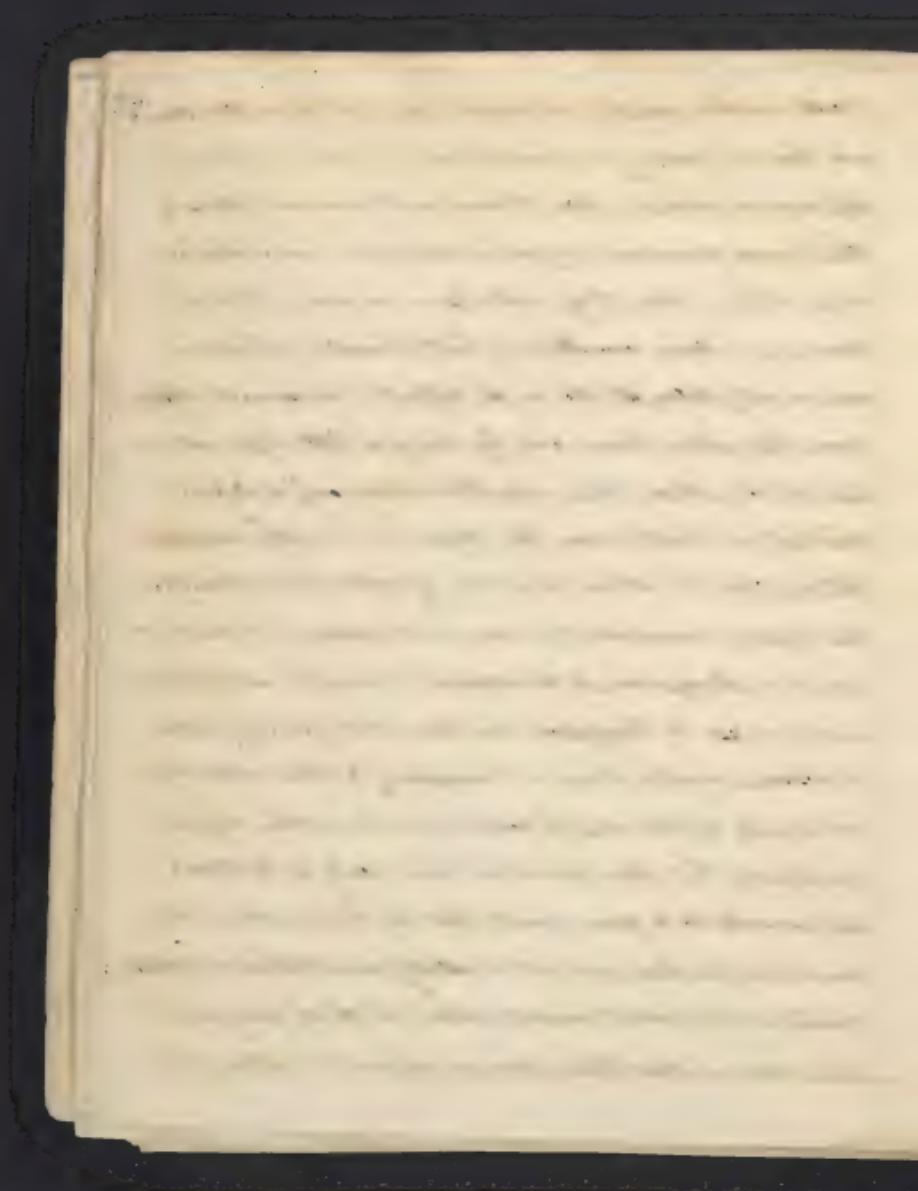


there is confined to the degree of intensity and force, and 51
is altogether fortuitous, and dependent on circumstances
whose influence has been ascertained and well defined.

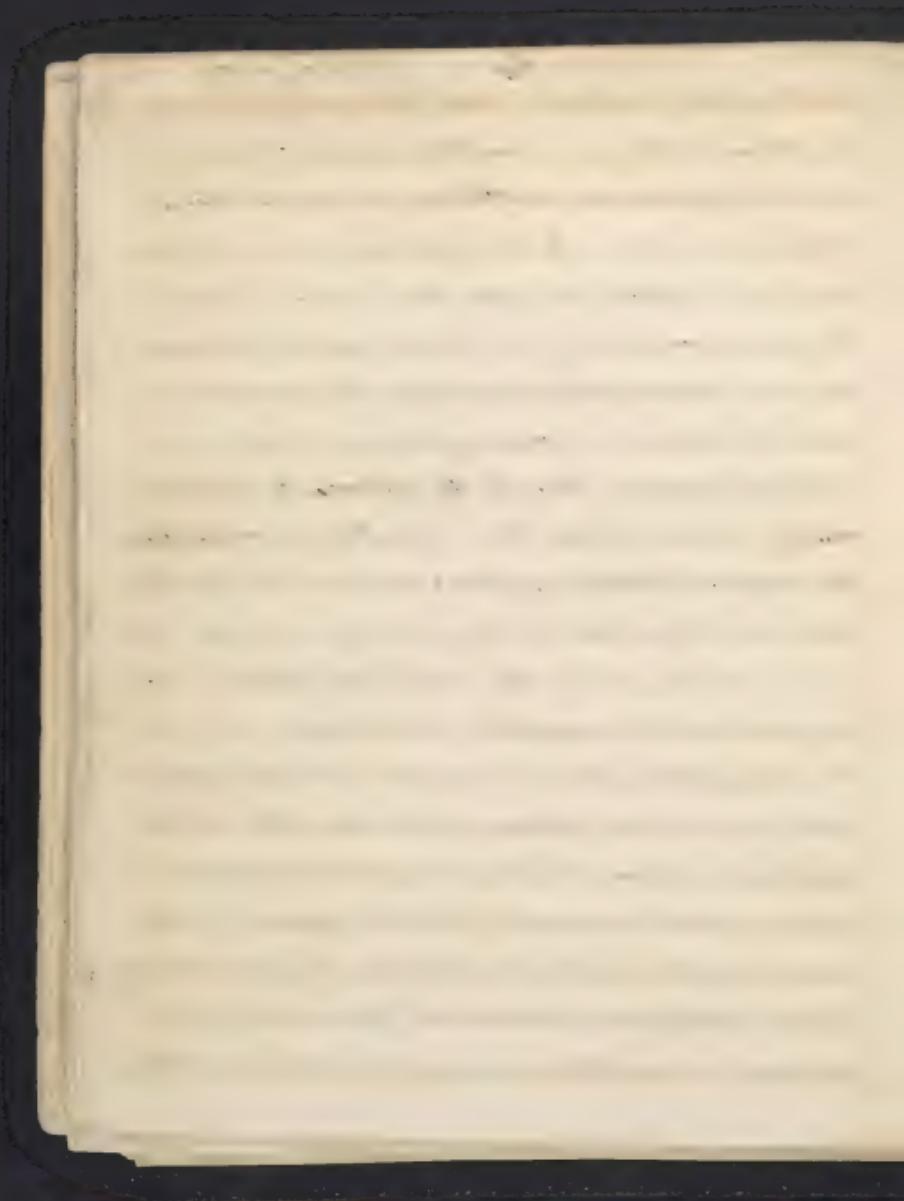
Dr Bruce soft after a long and elaborate examination of
very many yellow fever epidemics in various countries,
has pronounced the following judgment, which he has
adduced many facts and authorities to substantiate and
confirm. His readers, he says, will have seen that
yellow fever, like other marsh fevers, is always exasper-
ated by great heat, and extinguished or greatly mitigated
by cold; that, between the tropics, it prevails simultaneous-
ly with the milder forms of marsh fevers, violently attack-
ing strangers from cold climates, whilst the natives or long
residents are at most only subject to intermitents or mild
remittents; they will have also seen, that in temperate
situations, this disease in the early part of summer, before
the atmosphere has become intensely hot, is commonly
preceded by, or rather shews itself in, the forms of intermit-
ting or remitting fever, and that when exasperated by excess
of heat, it has sprung, and for some time prevailed under
the appearance of an epidemic yellow fever, the exception



of cold weather speedily reduces it again to its milder form, 52
and that a freezing temperature soon puts an end to its
appearance, even in these forms, as it commonly does to
other fevers occasioned by exhalations from marshes, and
to no others. And they will also have seen, that the
common bilious remittent of hot climates, which is
universally admitted to be the effect of miasma, differs
from the yellow fever, only by being a little less violent;
that, at the utmost, their symptoms vary only in degree;
and that, in truth, even this difference is often insuper-
able / p. 280. If it be asked why, if yellow fever belongs to
the class of partoxional or miasmatic Diseases, it does not
like this, always remit or intermit, it may be satisfactorily
answered, as Dr. St. George upon has done, that for any Disease
to observe regular hours, it is necessary that the vital organs
principally affected should continue in a certain degree
of integrity, that their functions should only be disturbed
and protracted to a given point; that they should still be de-
censib; as functions, and not be utterly overwhelmed and extin-
guished by the violent cerebral action and speedy gangrene
of the stomach that take place in aggravated yellow fever.

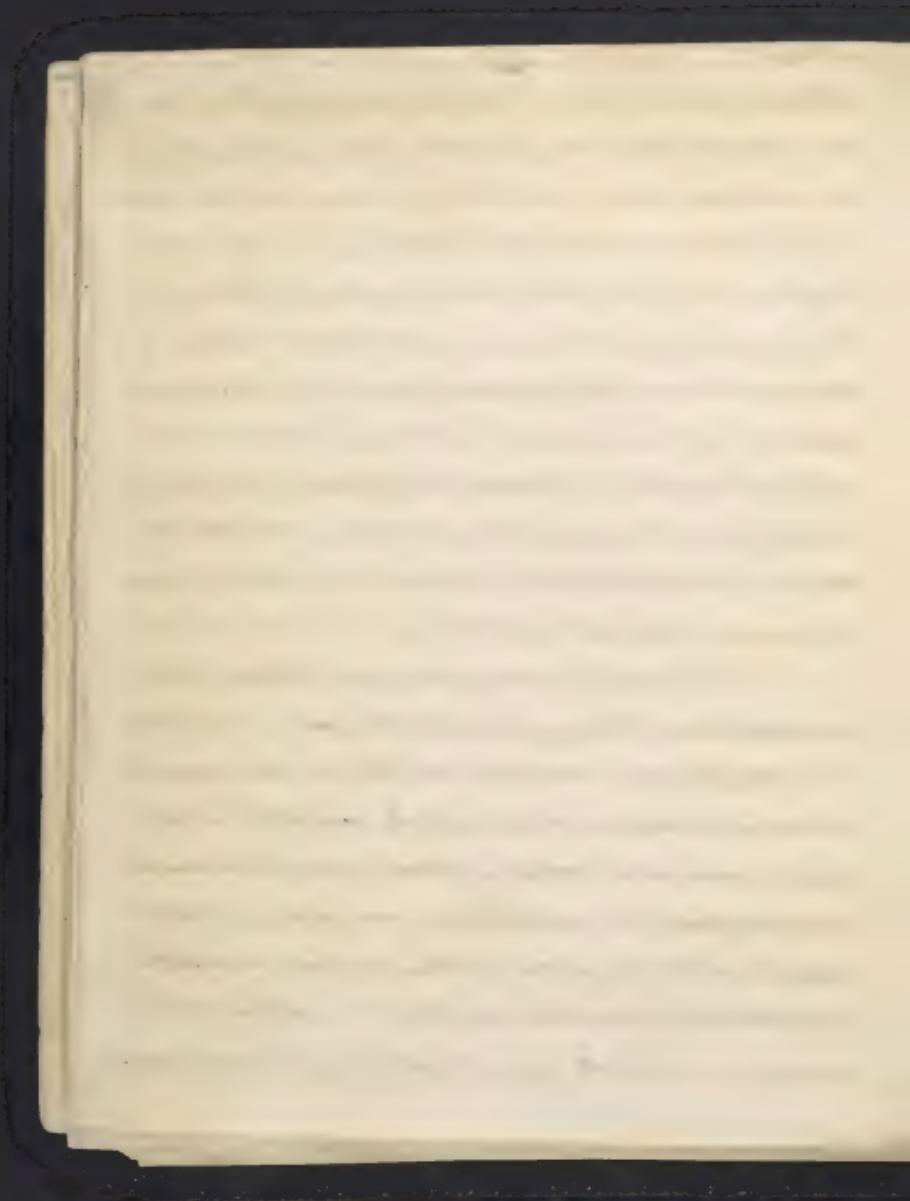


As the ulcer of a specific poison that would own a reg 53
with course according to acknowledged laws, it'll be allow-
to i. if inflammation or suppuration, no longer belongs
to the original stock, and is emancipated from these laws;
so the violent actions of the above fever impair and destroy
the animal functions, by which its crisis and convulsions
are regulated, or openly engender a new disease; as new
as the conversion of an ordinary venereal chancre into
a phagedenic slough, through the application of a potential
cautery." Johnson in Troth Ch. p. 368. Therefore, except from
the malignant violence of yellow fever and the reputation
that once belonged to it of being a contagious disease, should
some writers thus turn their backs upon facts and giving
indulgence to their superstition, fans out to invest
this disease with a specific character, and circumscribe it
within such limited phenomena and laws, the mild and
confluent small pox, which are considered as the same
disease, are not more alike than the different forma-
tions of marsh malady; nor is there a greater similarity
between dysentery and intermit. fever, which are
factual diseases, than commonly exists between the

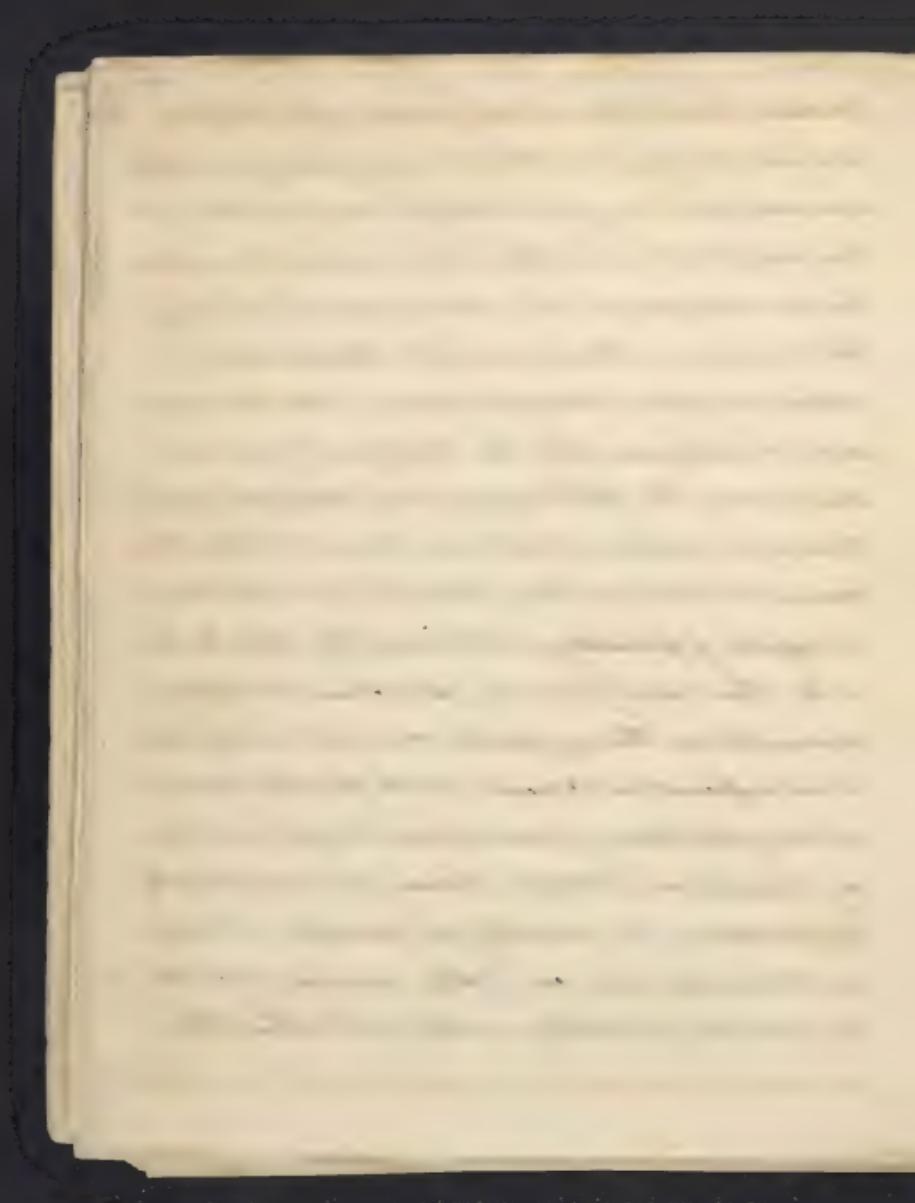


litter and yellow fever; Why not pursue pathological 511.
minuteness and discrepancy a little farther and consider
as a distinct and isolated Disease, every individual case
in which there is the slightest difference or variety of
symptom: then we shall have the species of Disease
nearly infinite, for who can recount all the intermediate
gradations between the extremes of severity of the same
malady? Of an individual epidemic, the yellow fever
of 1793 Dr Rush has observed that "From the history
he has given, it appears that it counterfeited all the
acute and chronic forms of Disease to which the human
body is subject." (vol 3 p. 131)

If, as I have every reason to believe, the vari-
ous gradations of bilious fever are the same in their nature;
if all these diseases resemble each other in all the points
in which I have endeavoured to demonstrate a simili-
tude; a similitude, extending to all essential circumstan-
ces and sufficient to invest these several diseases with the
character of identity of nature, then we have a right to
infer that they are dependent on an identity of cause,
modified in its effects by a variety of ascertained 1793-44.

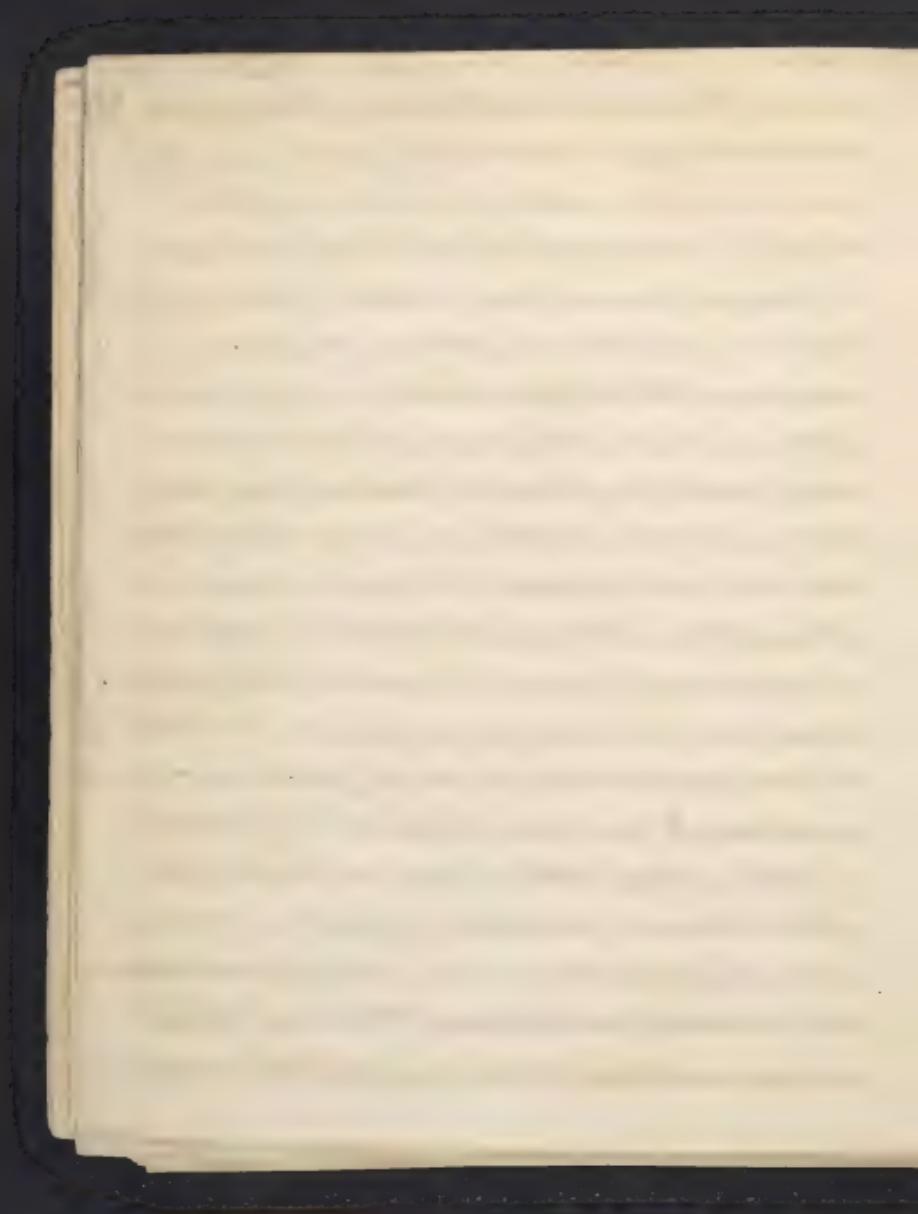


conditions, which I have already pointed out, &c, these 337
the intermittent and remittent fevers originate from marsh
miasma, so it may legitimately be concluded does yd.
yellow fever also: and as the former are perfectly independ-
ent on Contagion, we have strong reason for believing
that the same is likewise true of the latter disease. If
yellow fever were a contagious disease, intermittent fever
would be contagious also. The contagion of one would
also introduce the other disease, as the contagion of either
distinct or confluent small, box (between which the con-
nection is not closer than between the two other diseases)
is capable of generating indiscriminately either the one
or the other variety according to certain modifying
circumstances. Having pointed out what has appeared
to me sufficient to account for all the phenomena
attending the history of yellow fever, I might have closed
my remarks on its origin, leaving unnoticed another
reputed cause of it, a contagious principle, & belief
in its derivation from one of these sources precludes
the possibility of a belief in that of the other, the



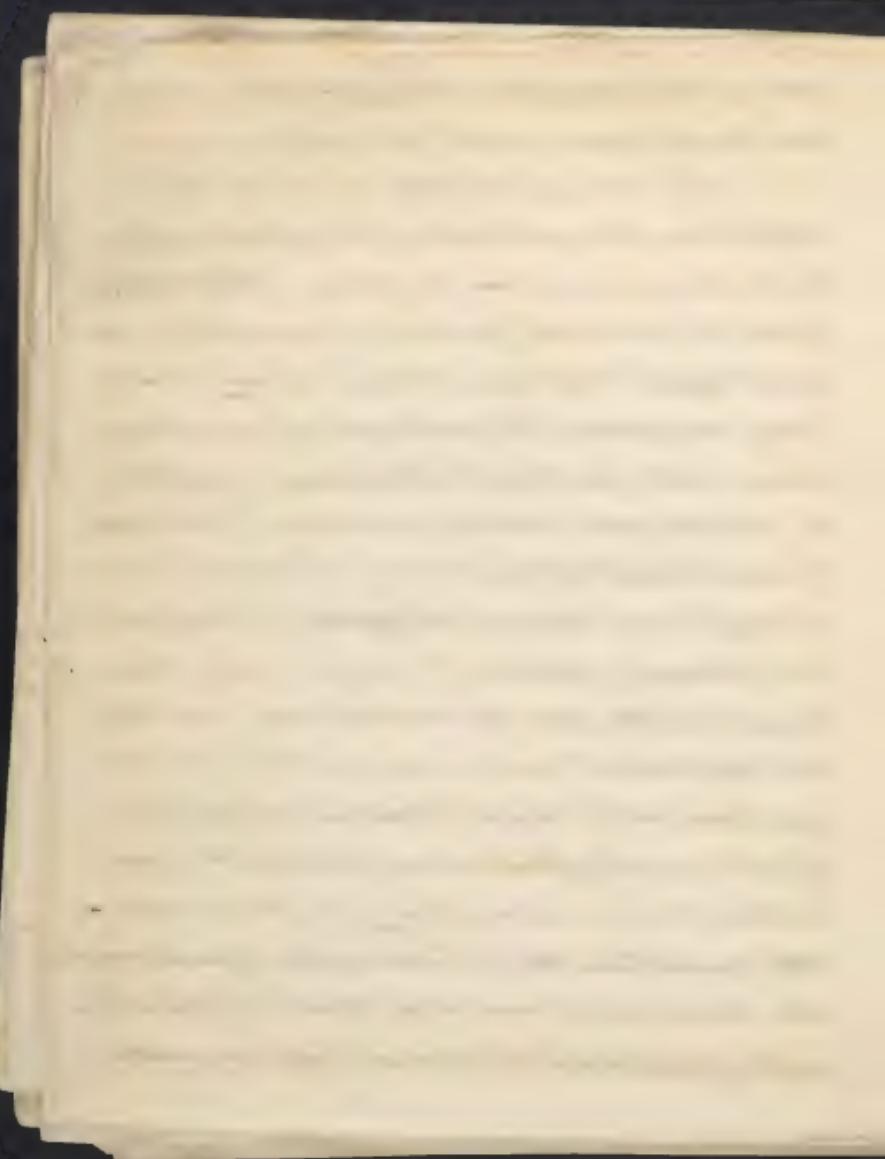
causes of diseases are limited in their powers of pro- 152
duction; their offspring are as certainly derived from their
own causes, as any species of animals or vegetable is
the progeny of that particular species alone. Miasmatic
and contagious diseases are as incapable of interchanging
their parentage, as the various contagious diseases are of
interchanging their specific derivations. But as some
writers maintain the contagious origin of yellow fever, it
will be proper to regard on its own merits the claims
of this agent to the reputation and rank to which it has
been exalted in the causation of the disease in question.

Though, therefore, the origin, to which I have assigned it,
must exclude any assignment or reference to a contagious
source, yet, for the sake of fair argument, I will consider
as inconsequential and insufficient any conclusions or inferences
that might result from the facts already stated, and
by starting afresh with this agent as I do with the
other endeavours to show that contagion cannot account
for the history and phenomena of yellow fever, and should
not be admitted as the cause of this disease though
we were unable to discover any other that was ade-



factory, we must reject a wrong solution of a post 572
lem, though we are ignorant of the right.

The nature of this gray and the length to
which it has already extended will necessarily confine
me to conclusions and general positions, without a detail
of facts. The dependence of yellow fever on contagion would,
were it possible at all, be susceptible of an easy and satis-
factory demonstration, the proof is perhaps of as simple and
plain a nature as that of the dependence of any effect on
an invisible agent. Narratives and histories of this disease
have been made with great ability, observation, and zeal;
its reputed importation and propagation by contagion have
been strenuously insisted on: the proof is entirely affirmative
and positive: the facts proper and sufficient to establish
this belief are not few in number and confined to a
few places; but of every day occurrence; they happen
by millions every hour in every quarter of the world;
so that it is an extraordinary, nay almost unpar-
alleled circumstance that a truth capable of such remark-
able advantage of demonstration should not have been
as firmly established and as universally acknowledged



as the exclusive dependence of smallpox on a principle of 582
contagion. The doctrine of the contagion of epidemics
was invented for a political purpose, by the heads of the
Christian church, in the middle of the 15th century. Before
that period, epidemics were referred, (save by that super-
stition which attributes them to the anger of the gods)
to atmospheric vicissitudes. Medical history traces to
a very remote era the occasional epidemic prevalence
of yellow fever in all the countries and situations
in which it prevails at the present day. In the cities
of these United States it is known to have appeared as
far back as these records of disease extend. In the West
India Islands it frequently broke out among their
earliest colonists, and the Southern cities of the Spanish
Peninsula, were severely ravaged by it several
centuries ago. The epidemic diseases, with which Spain
has been greatly afflicted, have occurred very frequently
till the present time, and, though all appear to have
been nearly of the same character, those before the mid-
dle of the 15th century were attributed to the atmosphere;
whilst those, since that period, have been imputed to

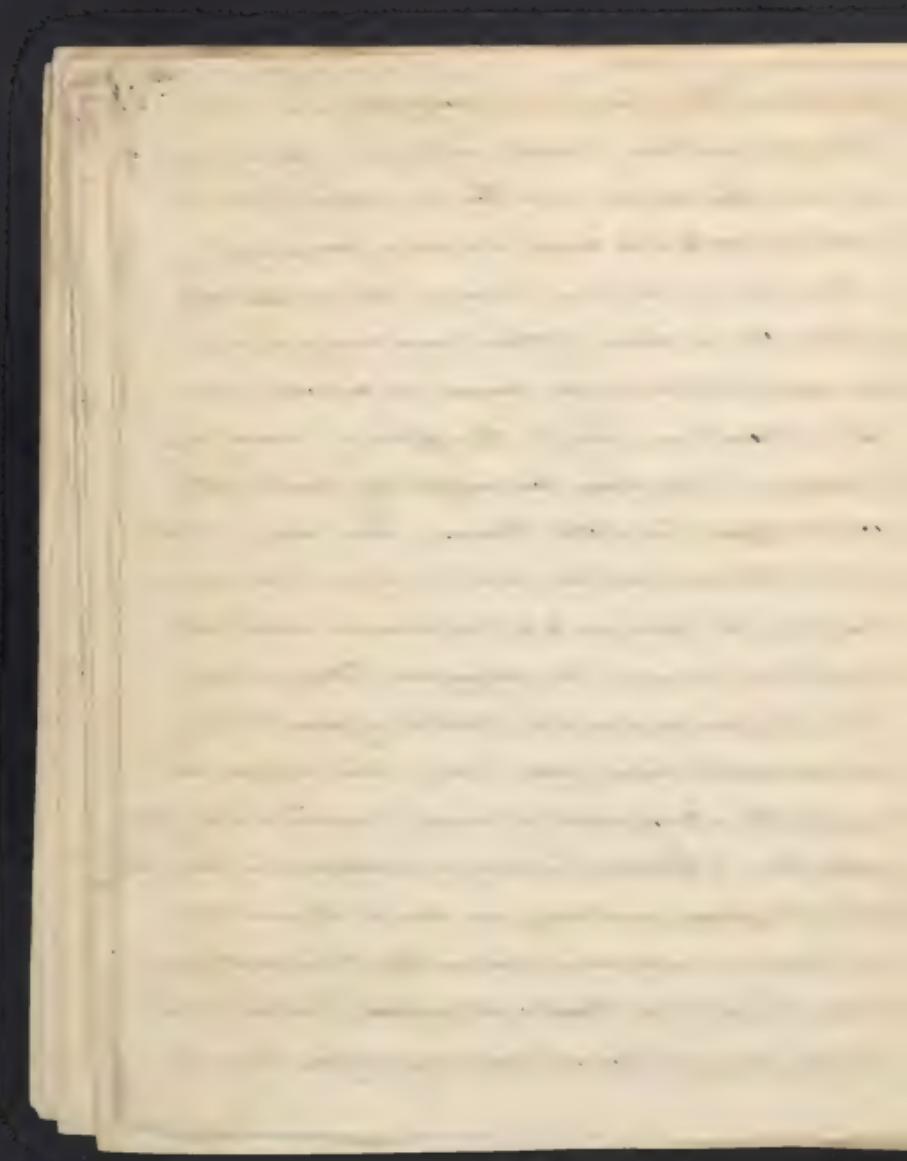
contagion, "tis strange; tis passing strange".

59-2

These are motives of nearly instinctive tenacity and influence that impel us to lay the origin of evils at another's door, and to derive it from a foreign soil.

The history of epidemic diseases, tells us that all of them, on the ground of their being contagious, have been imputed to a foreign source and imported from distant countries, though the offspring of nearly every country, and every where domesticated, they are no where acknowledged. The North Americans have chosen to look to the West Indies for their yellow fever; the West Indians to Africa; the Spaniards to the West Indies and America. The English used to import their plagues from Holland; and the Hollander from England; the Moscovites from China; and perhaps the Chinese from Muscovy. Whilst Dr. Phipps with irreputable industry imported by break of quarantine, the fatal yellow fever of Gibraltar in 1800 from Cartagena in transports which were placed in strict quarantine on their arrival.

Dr. Burnet, a contagionist, declares that Dr. Russell Physician to the Spanish Royal Hospital at Cartagena "positively asserts that the fever of Cartagena was brought from Caliz and



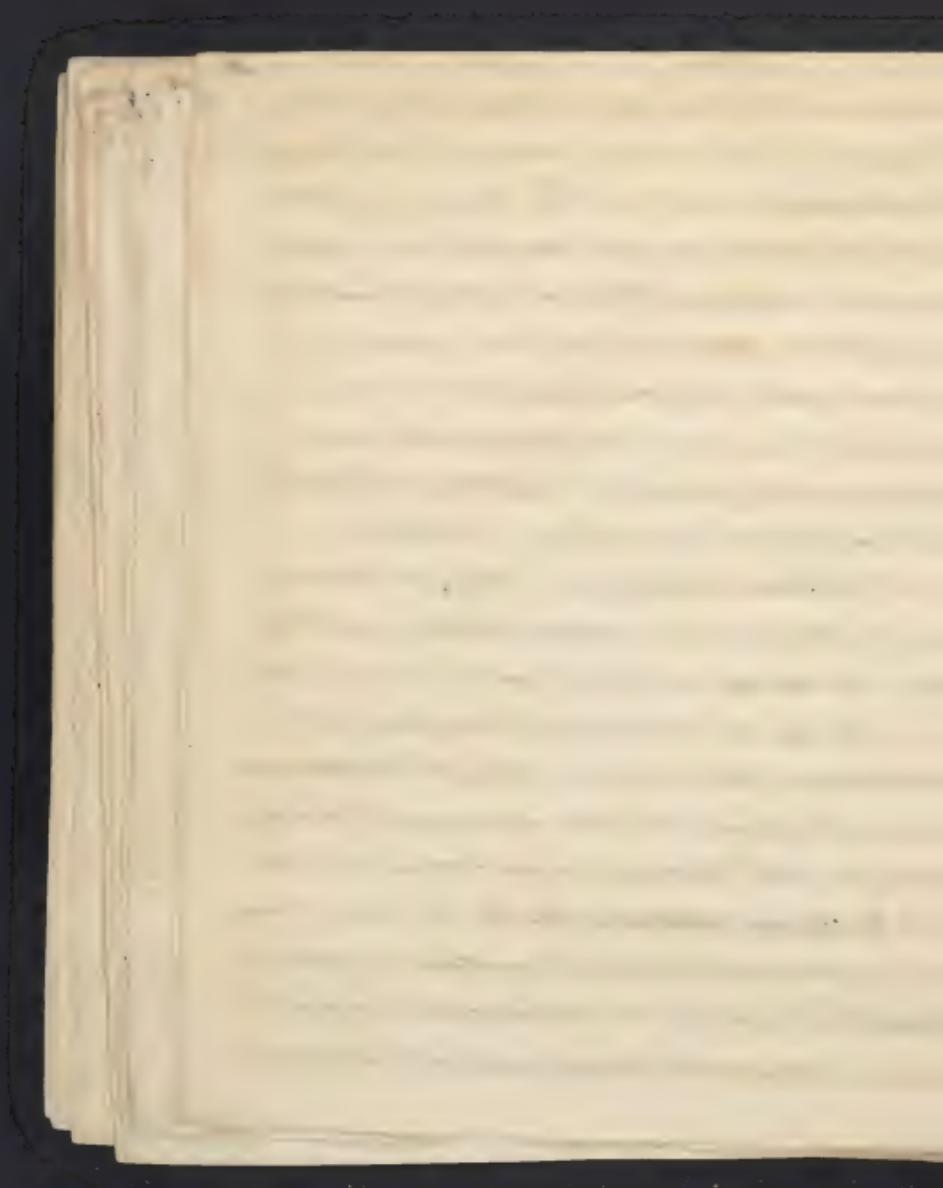
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Gibraltar in 1810." These different and opposite importations ^{8X} are supported by their respective advocates, by long arguments and circumstantial narratives. These contradictory assertions.

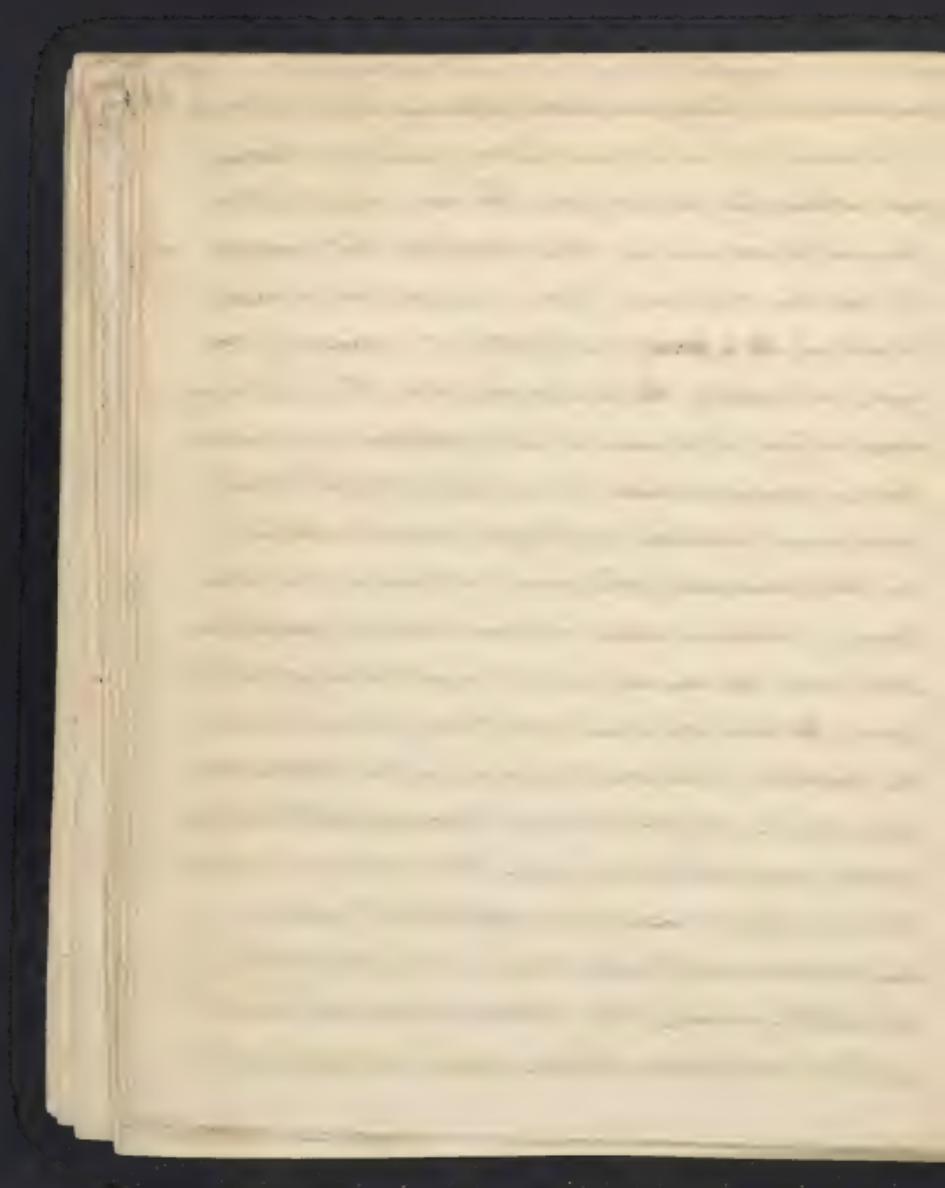
Dr Burchett has properly remarked, "Leave only to manifest the certainty with which the contagionists, who believe that an epidemic yellow fever must always proceed from importation, hazard to account for it."

This want of unanimity in fixing on the source of the disease or the place of its importation should be regarded as fatal to the doctrine. A contention.

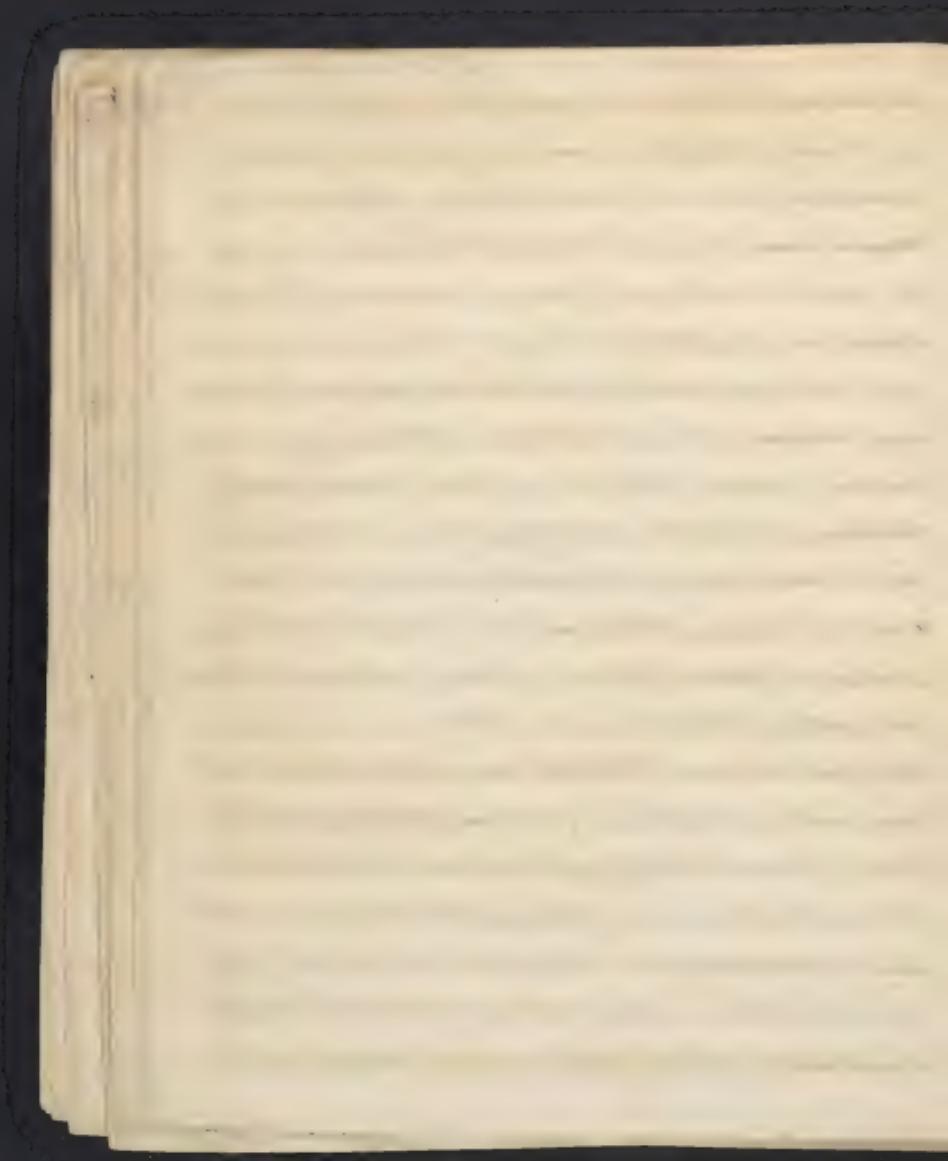
Dr Burchett contends for the contagious communication of yellow fever in an impure atmosphere, and disbelieves the disease can be propagated in a pure atmosphere. He has cited instances of its conformity to the conditions under which he says it appears and disappears, and ventures the opinion that the impure air, by chemical combination with the specific virus, becomes assimilated to it, ~~the specific virus~~ and thus the lower or original ferment is not changed, but multiplied and greatly increased. That yellow fever is propagated throughout an impure or miasmatic atmosphere and is limited to such



an atmosphere being incapable of affording support to it, is 1161.2
what every body, who denies the contagiousness of the disease,
most strenuously contends for. He would expect yellow
fever to be coextensive with miasmate that produced
it; and has Dr. Hirsch offered a single fact or reason
to induce ~~the~~ ^{him} to believe that it is caused by con-
tagion and not by the miasmatic air. He has merely
asked, why if the disease be not contagious, is the same
disease always produced. We admit both that con-
tagion must produce a specific contagious disease,
and that miasmate also must produce a miasmatic
disease, of which nature we have contented yellow fever
to be. But the disease induced is not always yellow
fever, for when the cause is not very concentrated all
the gradations of miasmatic disease appear promiscuously
in the same city or district. Nurses and students on
yellow fever patient are, from their common exposure
to the miasmate, sometimes attacked with yellow fever,
and sometimes with intermittent and remittent, & for the
assimilating forces that is contented for, we have the
author's word alone. He has given us, indeed, a few



illustrations of his meaning and of the nature of the agency of his hypothetical ferment, by referring to the assimilating powers of leaven, and also of the small pox virus in converting the fluids of the human body to the peculiar fluid which may be introduced into the system. In support of the reality of any such power in the atmosphere, the author has supplied neither real, nor reasons nor facts, which an extraordinary opinion certainly requires. Had it been true of any known contagion, the author would gladly have mentioned it. Had it been true of the variolous virus that it converts the noxious atmosphere for a great distance into a specific poison capable of communicating small pox, we certainly should have been told of it. But even contagionists admit that the disease can be contracted only within the sphere of a few feet, beyond which there is perfect safety, yet we are told, without reason, that yellow fever is contagious, and that there is no other way of reconciling this opinion with the fact of its spreading over a large city in a few weeks except by admitting that the whole extent of atmosphere has

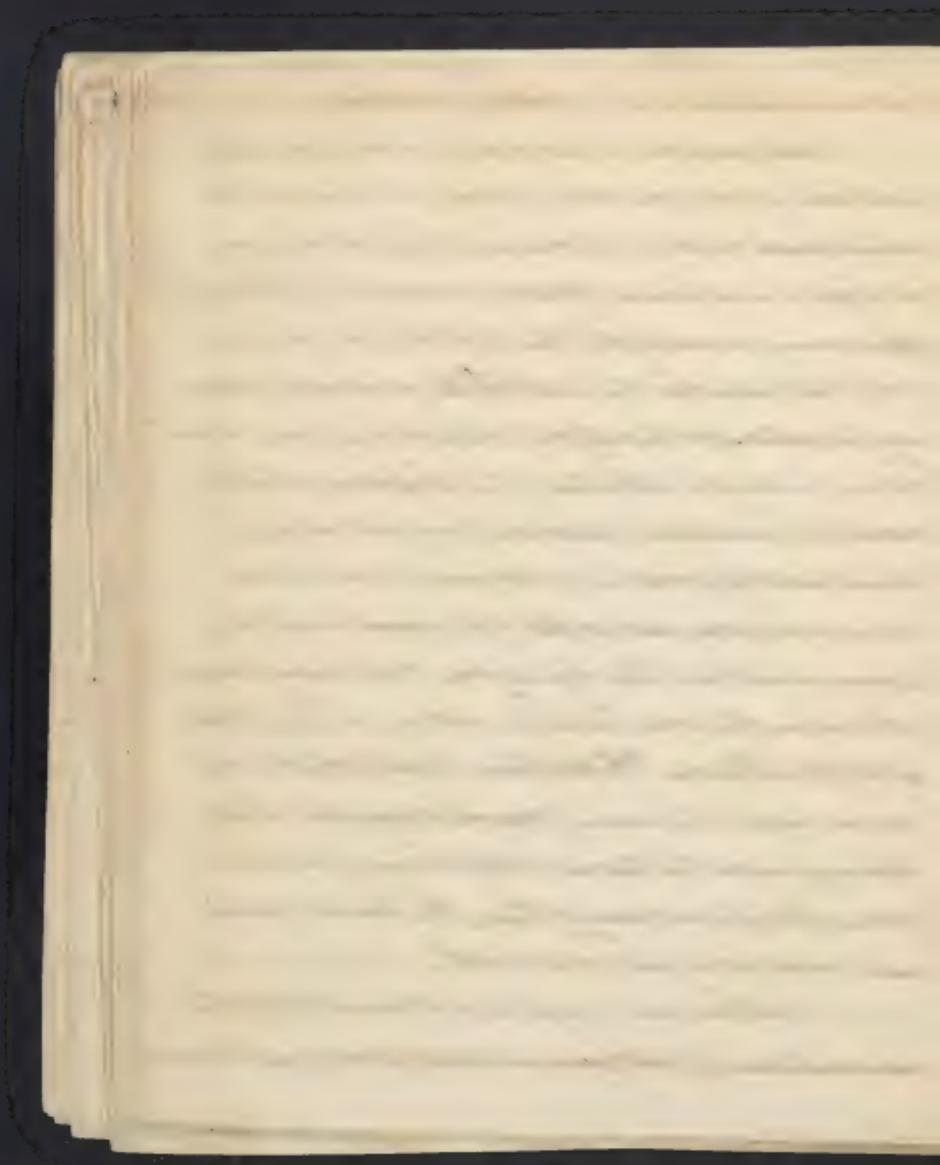


become assimilated to its peculiar contagion.

pp. 12

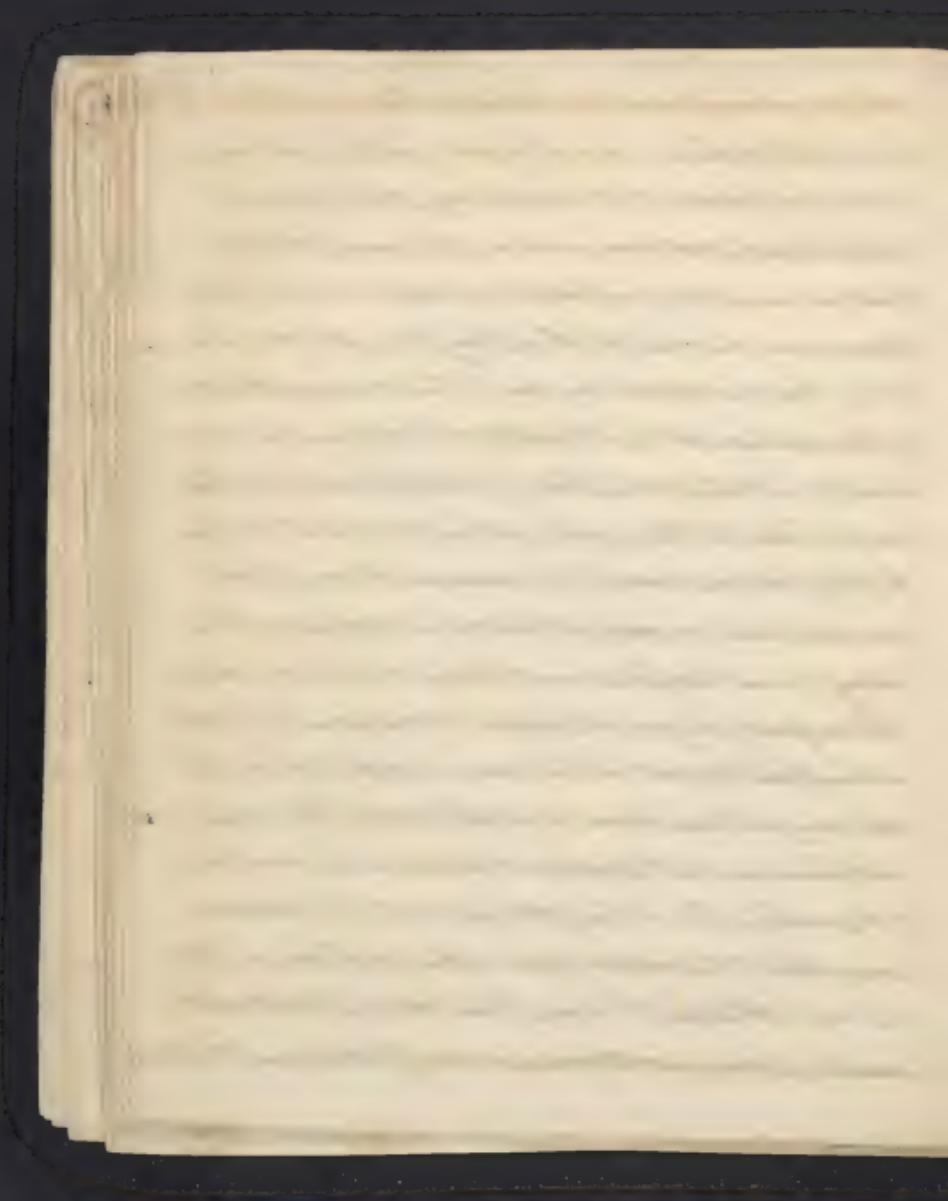
I will now cite a few cases in which, had yellow fever been a contagious disease, it could not have failed to manifest such property by communicating itself when removed beyond the influence of marsh miasma. Dr. Brerett, after having investigated the yellow fever epidemics of the West Indies and the United States, makes the following observation, for the support of which he has given thorough out his history, the authorities of the physicians who have recorded the particular epidemics. "The fact," says he, "which decidedly proves the yellow fever to be non-contagious, is that of its never having been communicated to others by any one of the many thousands who, in in the West Indies, as well as at Charleston, Norfolk, Baltimore, Philadelphia, New York, &c. were removed beyond the reach of marsh miasma, while labouring under the disease or after having imbibed its poison; though, in many of these, the disease appeared in its worst forms, and proved mortal."

Another, and if possible, a stronger, proof of the non-existence of contagion in yellow fever, says the same



action is derived from the Hospital. He has established ^{W. T.} 92
this fact throughout his history, and has subjoined in
further confirmation of it the following extract from Dr.
Miller's Report. "No communication of the disease was ever
observed in yellow fever Hospital, situated at a small dis-
tance from the cities to which they belong. No exception
to this has ever occurred in any of the numerous cases
of this pestilence at our Hospital at Bellevue, the Marine
Hospital at Staten Island that of Philadelphia or any other
in the United States; avoided the malignant air of
the city and been avoided. The numerous volume of med-
ical attendants, nurses, wash-women, servants, &c which
belong to an Hospital, must be known to cover fully

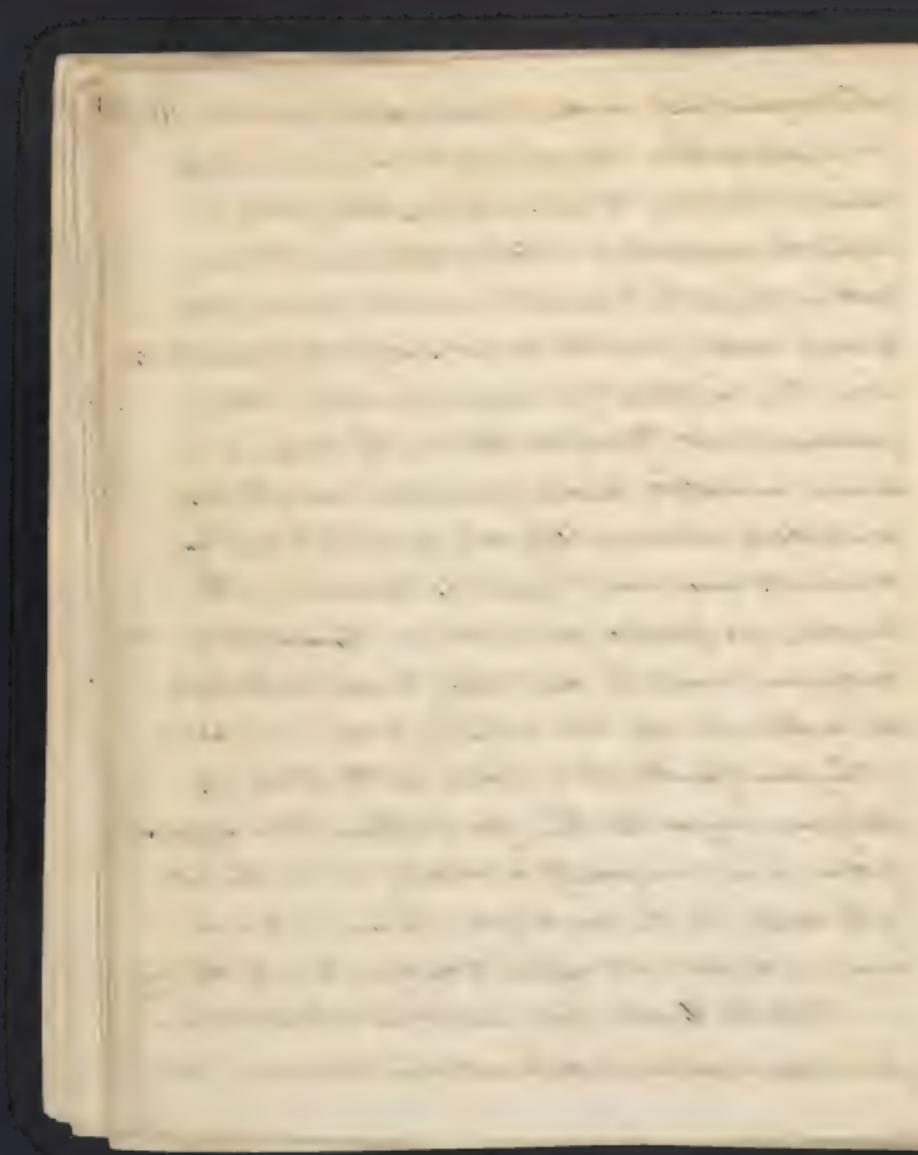
"How greatly they are all exposed to contagion, if it can
be supposed to exist in the case, is equally known yet,
not only all these have invariably escaped the disease,
but likewise all the persons occupied in the removal
of the sick." Dr. Miller adds, in a note, that several
persons died of the yellow fever in the lime-works in 1798.
and that "although the house then contained about eight
hundred persons, no communication of contagion took place."



the frequent post mortem examinations of yellow fever patients have always failed to communicate the disease. But as if to place the question of Contagion beyond the possibility of a doubt, experiments, decided with judgment, and executed in such a manner as to leave nothing omitted or not satisfactorily ascertained. 72
never been instituted by many physicians, these, performed by Dr. H. Smith at Phila in the presence of several respectable medical gentlemen, are of a very remarkable character: they are such as almost any reasonable person would regard as conclusion of the negative of a question, and such as a thorough going Contagionist would be most likely to call for to decide the matter, had they been wanting or never performed.

They are of so direct a nature as to decide positively one way or the other; for it appears to me impossible if there is any uniformity or stability in the character of the disease, for the result of the experiments to be one way, and the fact with respect to Contagion to be the other way.

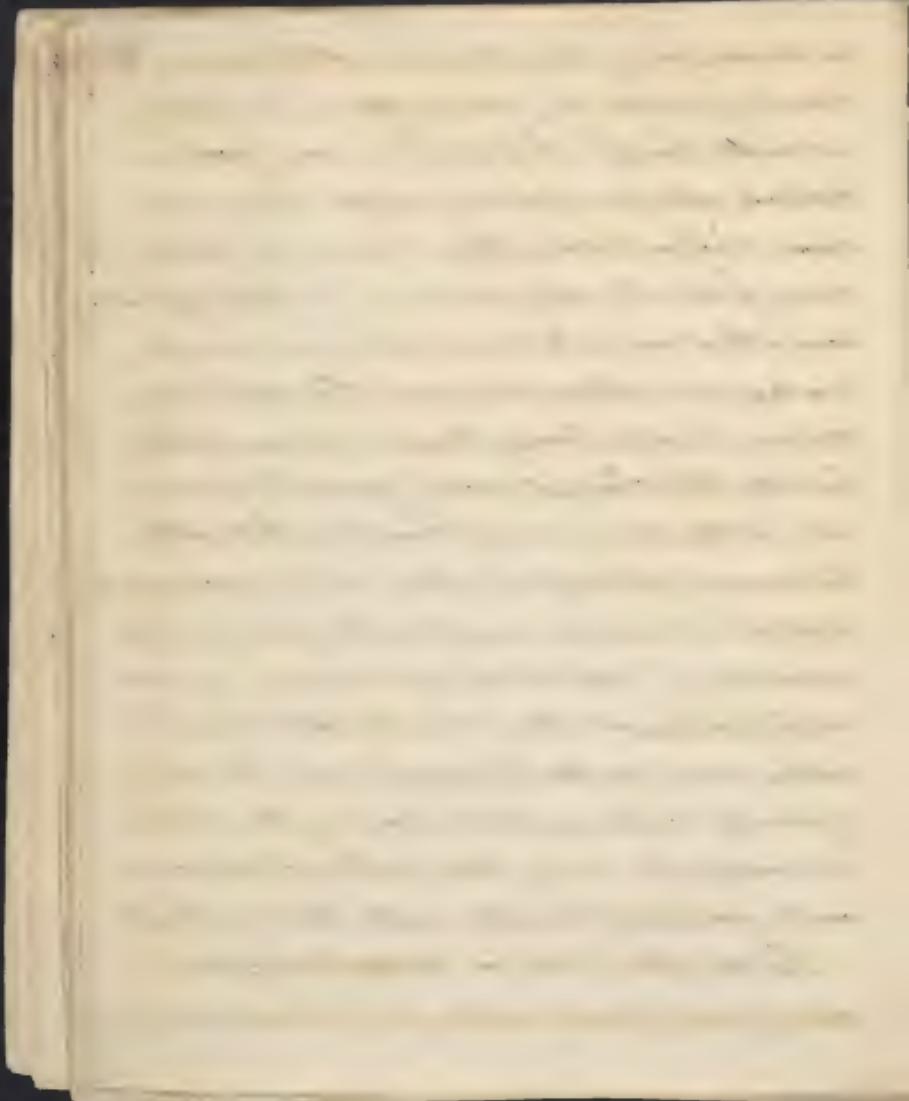
Had the disease been small pox and not yellow fever, these experiments could not have been made without



the disease having been communicated to the latter. 111 6

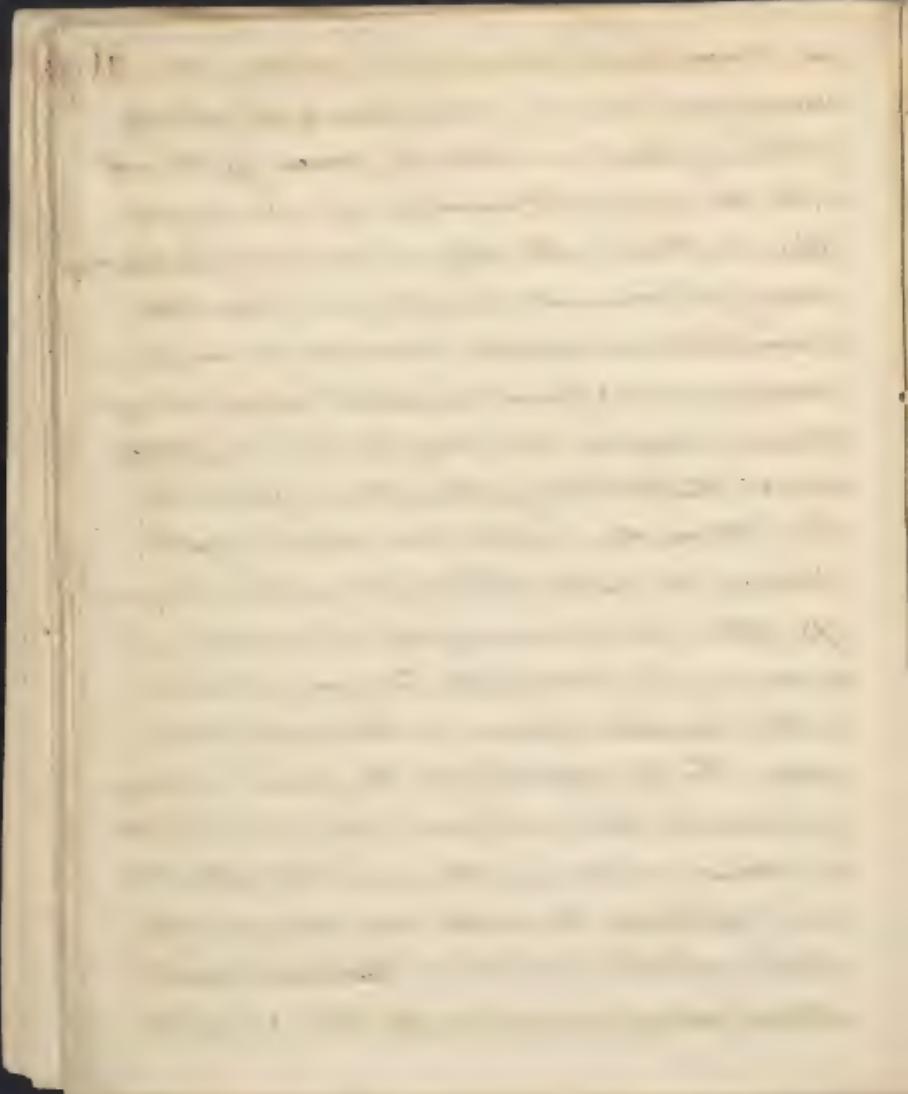
critical of whom they were performed. Dr. Footh inoculated himself with fresh black vomit from a moribund yellow fever patient; a slight inflammation ensued, which subsisted in three days, and the wound readily healed. He then confined, by a sticking plaster, some of the same matter, over a cut in his arm, for two days; no inflammation ensued. He repeated these experiments above twenty times, in various parts of his body. He also put recently ejected black vomit into his eye, and inoculated himself with the saliva and serum of yellow fever patients, without inconvenience or effect. He exposed himself with impunity to the excretion of fresh black vomit heated in an iron vessel, and then swallowed the insipidated remaining matters made into pills. Finally he drank two ounces of recently vomited undiluted black matter, and found it harmlessly, after having taken without effect considerable quantities of similar matter diluted with water.

Though yellow fever, for reasons already given, most frequently prevails in large and commercial cities,



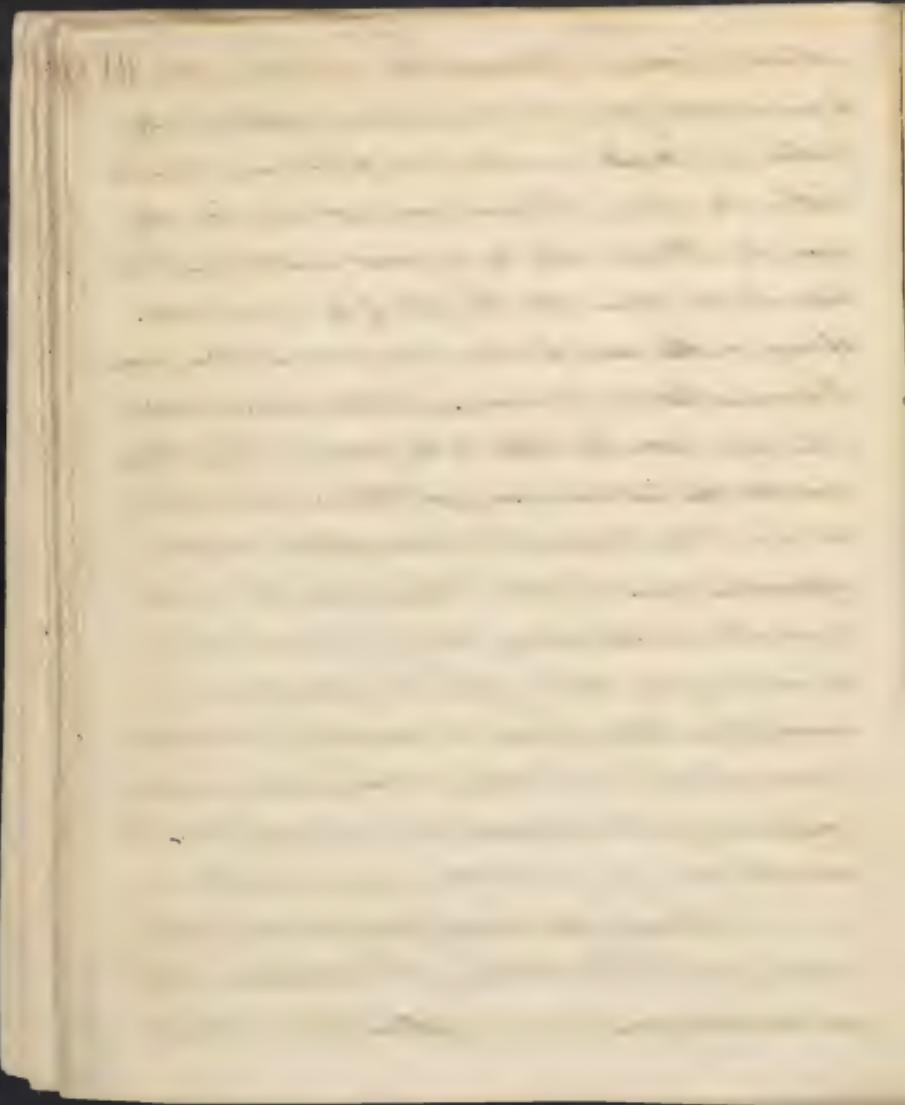
yet it sometimes breaks out in the interiors of the ~~WV~~^{MD} country and in situations which preclude the possibility of its having been carried thither by persons affected with it. In the intensely hot seasons of - 97, 98 and 99, it appeared in Bald Eagle Valley in Penn^a [J. G. M. A. Vol. 64]

During the memorable years of 1814, and 1821, whilst intermittent and remittent fevers were unusually prevalent and malignant throughout many of the upper counties of Virginia and along the Potomac, particularly at Harper's Ferry, yellow fever raged at the city of Alexandria. Yellow fever occurred, says Dr. Potter, on the Eastern shore of Maryland in the year 93, "after a spring unusually wet, and a summer as uncommonly hot" (Premise on Contagion) The same author furnishes evidence of a still more decisive nature, he has extracted from the journal of a voyage down the Ohio in the year - 96 by Mr. Elliott an account of a severe yellow fever that afflicted the town of Gallipolis. The mortal cases were generally attended with the black vomit, "This disease", says Mr. Elliott "certainly originated in the town, and in all



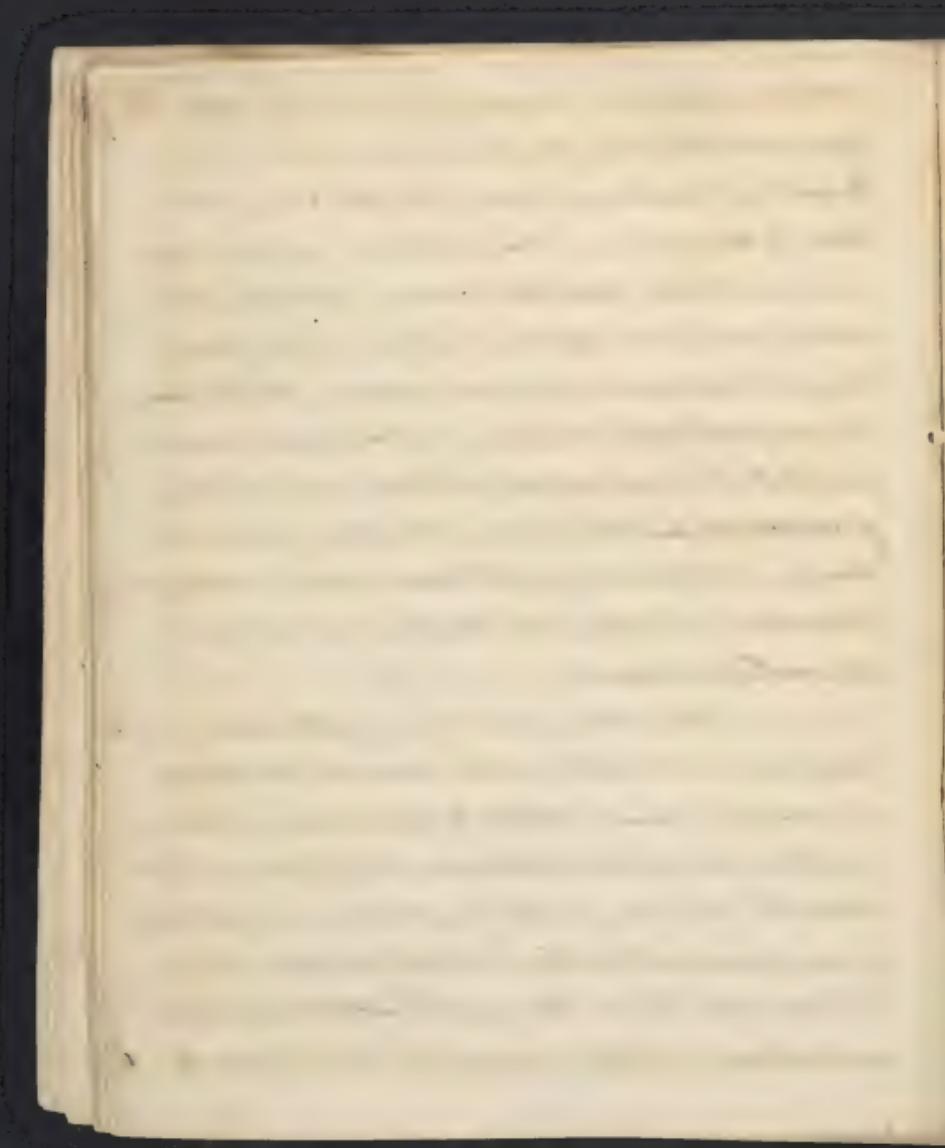
vorability, from the filthiness of the inhabitants, added ~~1818~~
to an unusual quantity of animal and vegetable matter
faction in a ~~stall~~ number of small ponds and marshes
within the village. The fever could not have been taken
from the Atlantic states, as my boat was the first that
descended the river after the fall of the water in the
spring; neither could it have been carried from New
Orleans, as there is no communication at that season
of the year, from the latter to the former of these places;
moreover, the distance is so great, that a boat would
not have time to ascend the river after the disorder
appeared that year in New Orleans, before the winter
would set in; M' Slaney, having his travels through
the interior of our country, found the yellow fever in
several places, Having seen it previously in our seaports,
he could not have been deceived. For further examples
confirmatory of the indigenous origin of yellow fever, the
valuable memoir of Dr. Trotter may be consulted.

Having thus hastily run over some of the
reasons, which I held decisive of the indigenous origin
and non-contagious power of yellow fever, I shall,

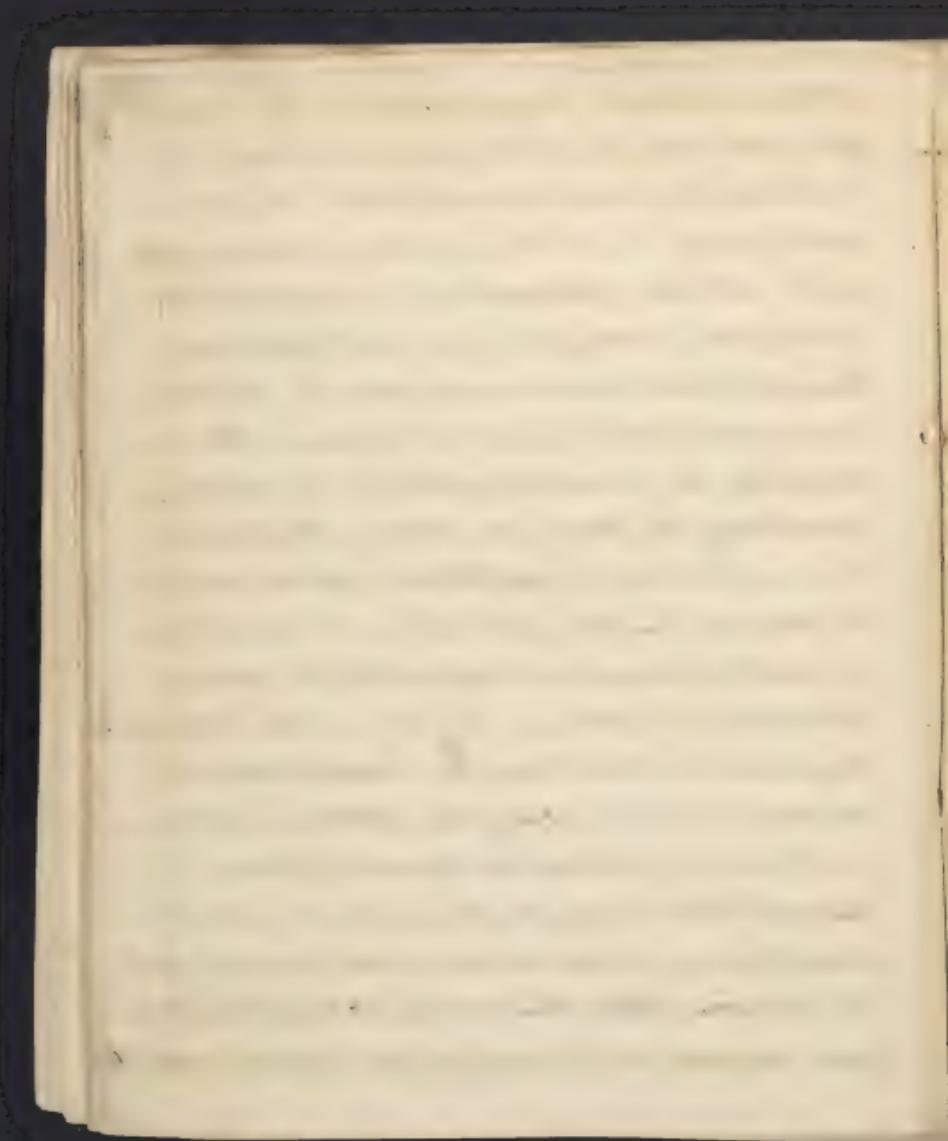


without offering a comment on what has gone ~~up~~ 67 before, but that my remarks on the cause of this disease by comparing a few of its phenomena with those of contagion, in order to illustrate not only their incompatibility but their direct opposition. It will hence appear that the history of yellow fever cannot be accounted for by a reference to the peculiar and specific properties of a contagious principle, but that it is in perfect harmony with the laws of epidemics, and that, like intermittent fever, the disease is dependent for its cause upon a miasmatic atmosphere, and appears or disappears according to the weather and season.

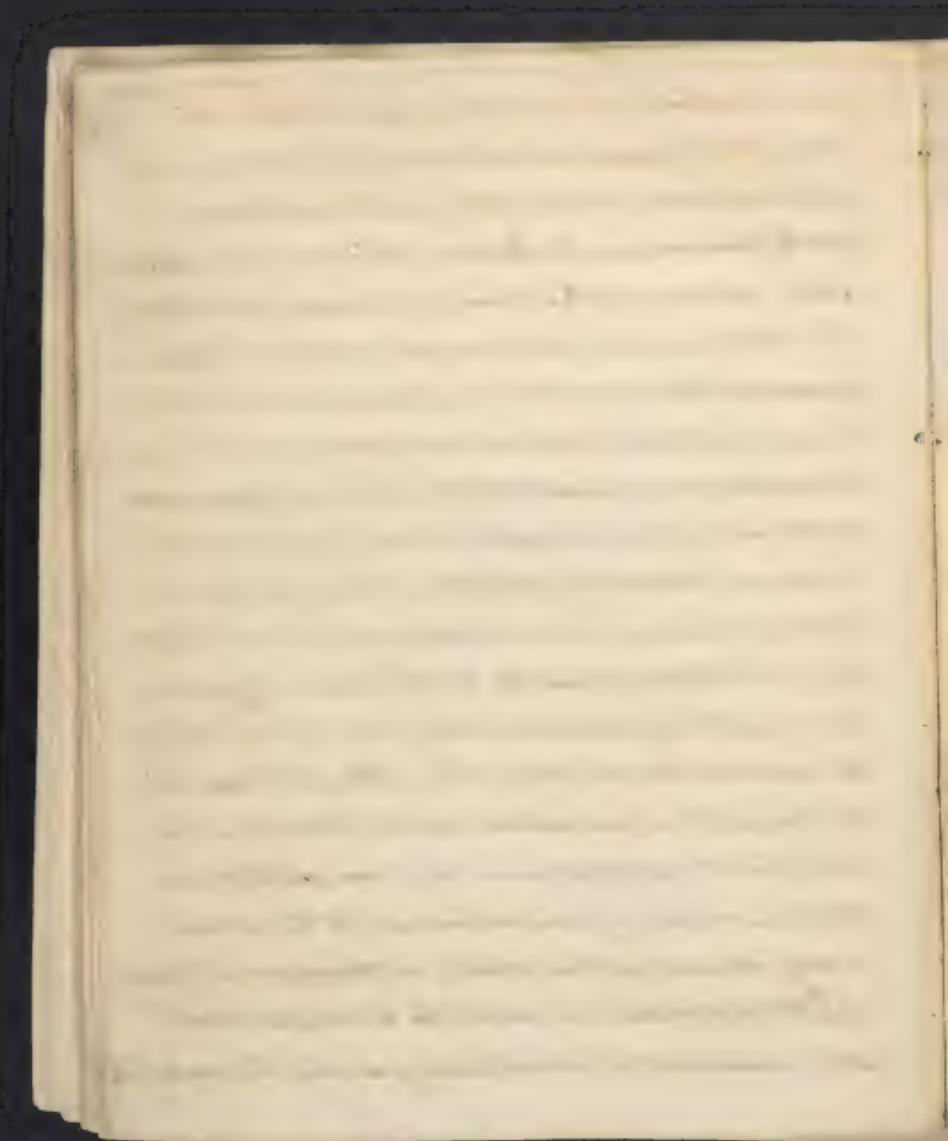
It has been remarked of epidemics, by nearly all writers, that at their rise, all other diseases are merged in them or obliged to assume some of their symptoms, and at their decline, they degenerate into others. This has been noticed of yellow fever in particular by numerous authors. Thus Dr Rush mentions, that in the year 1793, "the influenza, the scarlatina, and a mild bilious remittent prevailed in Phil^a before the



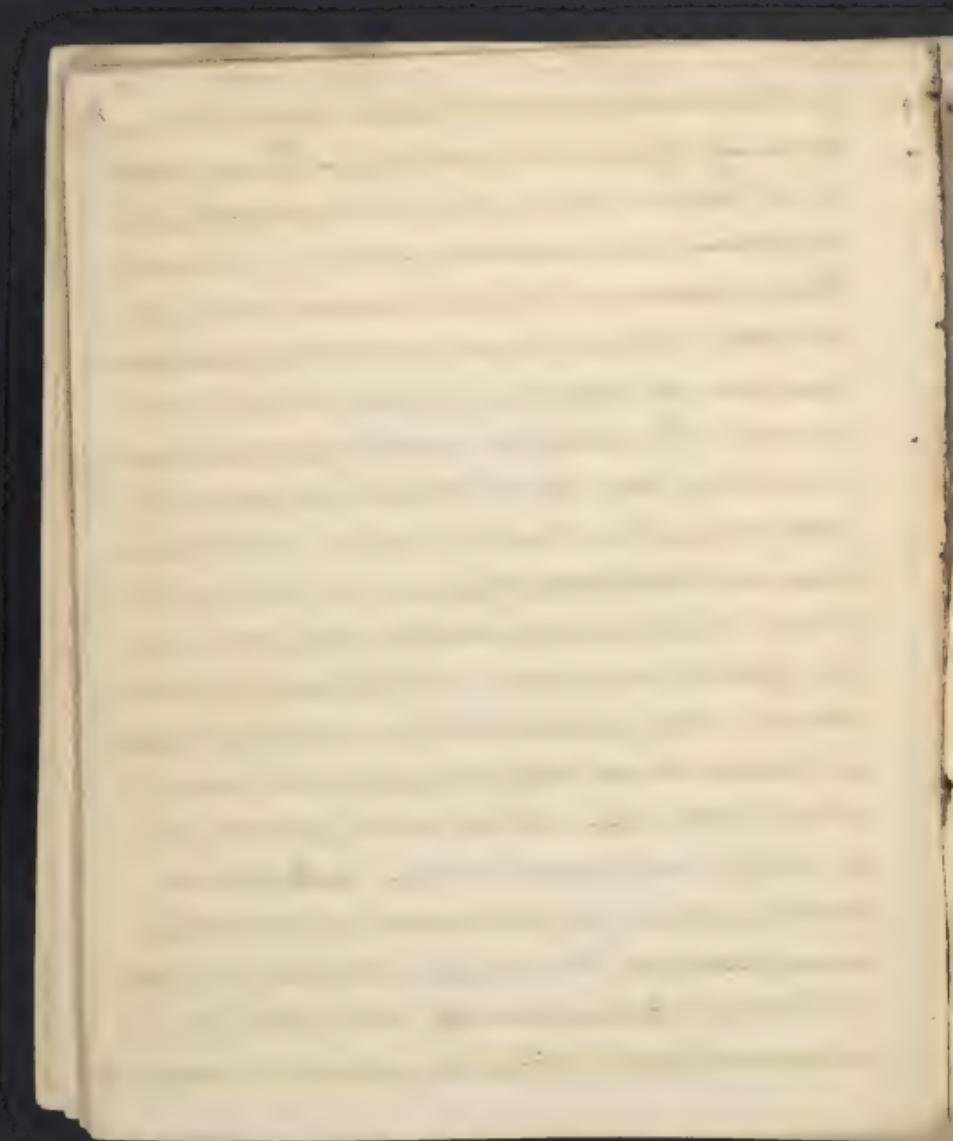
yellow fever made its appearance in the course of 1773
of a few weeks they all disappeared, or appeared with
symptoms of the yellow fever; so that, after the first
week of Sept. it was the common epidemic of the
city." All these diseases, though epidemics, were
by less force in consequence of a less powerful cause,
than yellow fever. In all such cases the atmosphere
is impregnated with the seeds of the disease. This is
evidenced by the fact already stated and the extensive
prevalence of the disease, as well as by the contempo-
raneous effects on the vegetable and inferior ranks of
the animal kingdom, effects which it is impossible
to account for save on the supposition of a noxious
atmosphere, beg. which is slight, and the brute creation
languish and die. Even Sir James Fellowes has
recorded that during one of the yellow fever epidemics
in Spain, so poisonous was the air that Canary birds
died with blots issuing from their bills, and yet, strange
to tell this very yellow fever was imported and propagated
by Contagion. There then was an acknowledged cause
quite adequate to the morbid effects in question, notwithstanding.



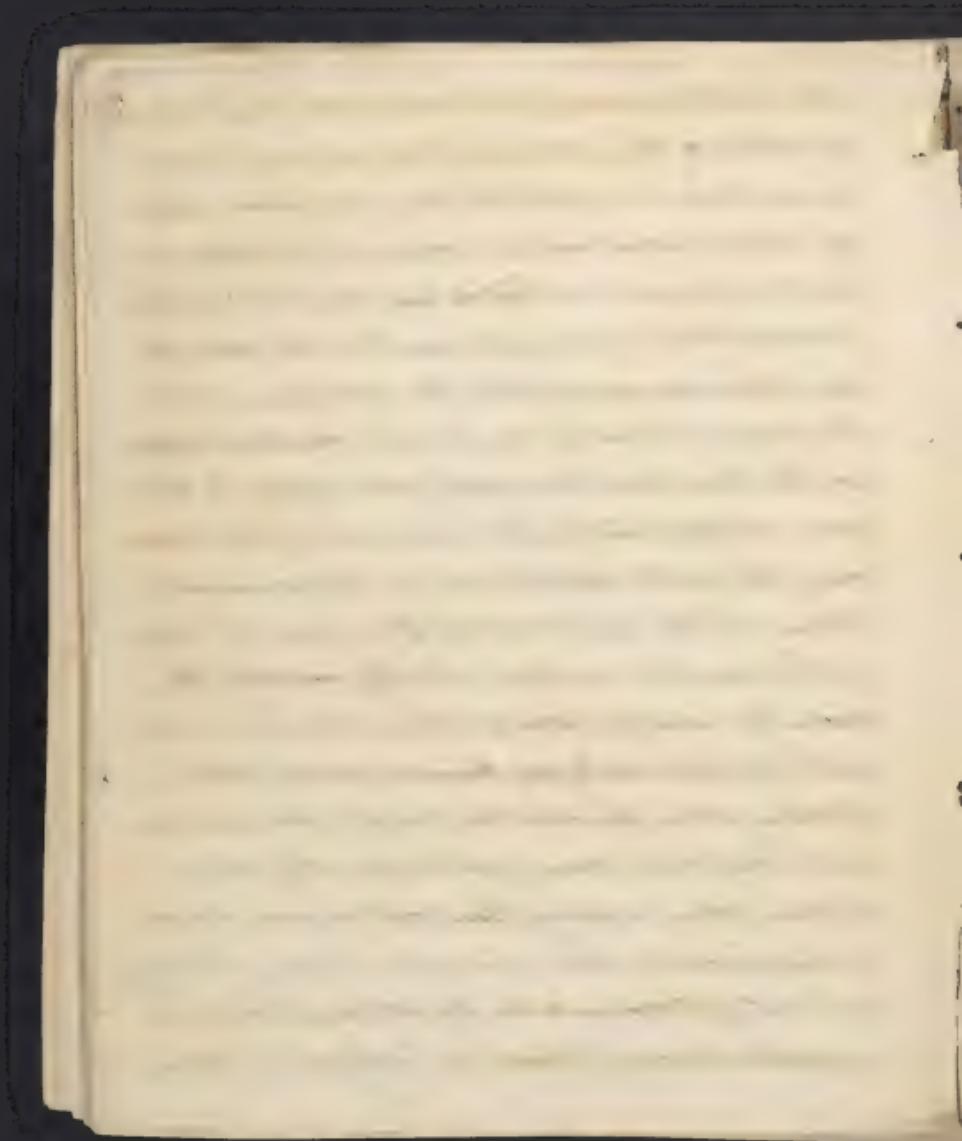
standing which, an unknown hypothetical agent, H/1,
resting for its credit on our inability to discover a
sufficient cause, is unhesitatingly called in to account
for the phenomena - the disease, this evinces a flagr-
ant ignorance of the common principles of Philosophy.
It is laid down by the great Newton that "more causes
of natural things are not to be admitted than are both
true and sufficient to explain the phenomena." Dr Rush
tells us that every person contained the mortific mias-
mate in his body during the fever of 1793, as was evinced
by various premonitory symptoms, which fell far short
of actual disease, but which only waited for a subtile-
ting and receptive agent to enable them to develop
their effects in full blown yellow fever. It will hardly
be pretended that this could have been the case had
the disease been independent on the atmosphere and
relied for its propagation and diffusion solely on a
contagious radiation from individuals to the distance
of only a few feet and which, in consequence of such
limited radiation, can extend to a comparatively
small number of the inhabitants of a city, the majority



of which number small as it is, have acquired an 71
immunity against its effects from a previous attack 72
in all contagious diseases, and, in one in particular, from
inoculation and vaccination. Another very important t.
law of epidemics, and one which forms a prominent
distinction between these and general Contagious Diseases, ma.
rises from their capability of affecting the same person,
repeatedly. All authority is against any such exemption
or immunity from repeated attacks in the instance of
yellow fever. Were it not superfluous all the West
India and United States Physicians who have seen the
disease might be cited to declare that yellow fever
does affect the same person repeatedly, though for reasons
elsewhere stated, repeated attacks are not very frequent
in tropical climates, though they may occur annually
at the North, Those, who have claimed for yellow fever
the property of contagion, cannot have contemplated how
monstrous would be its effects under such an additional
means of destruction. A malignant volatile contagion, attack-
ing the same individual repeatedly! The existence of a being
endowed with such exterminating weapons is incompatible

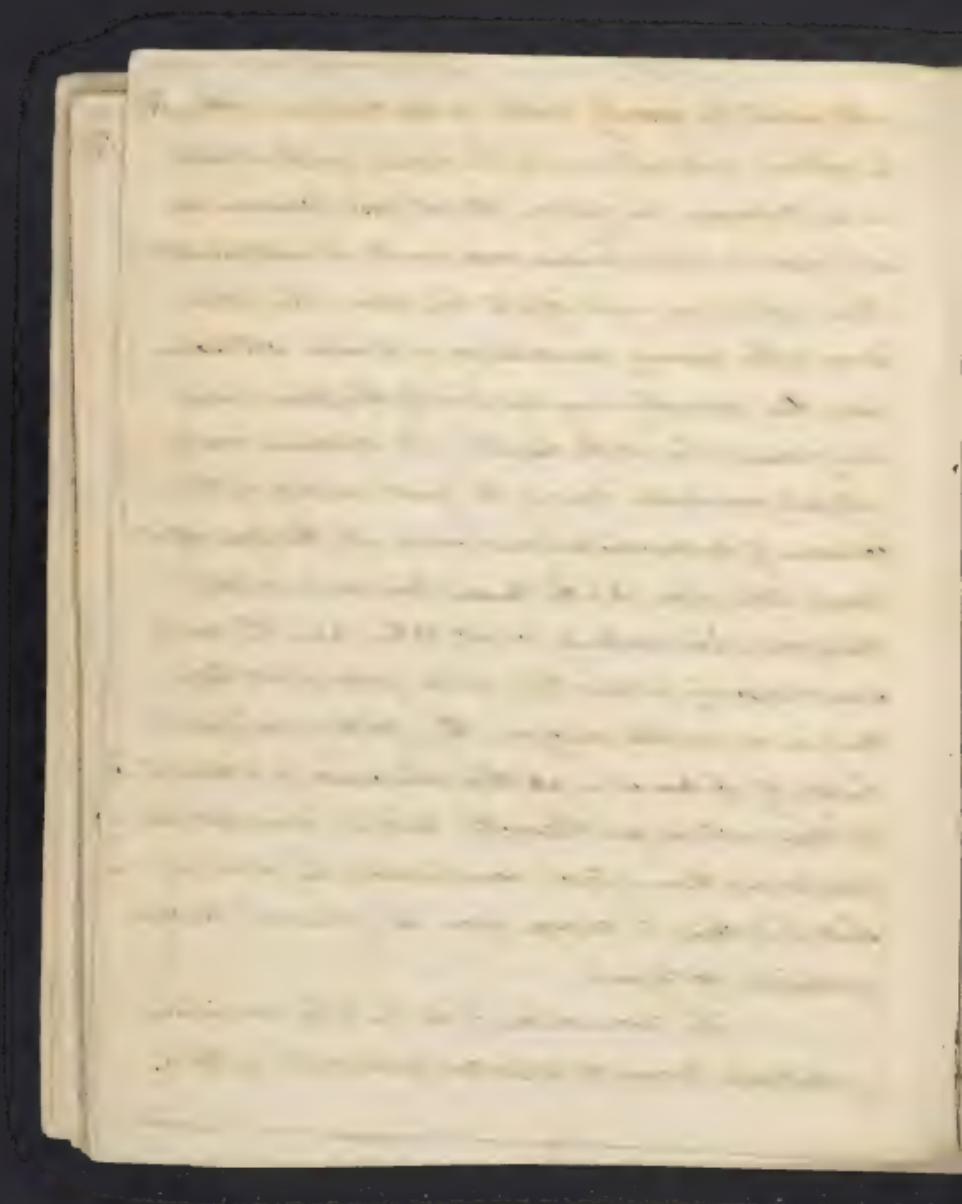


with the continuance of the human race, Suppos 72
the small pox had not conferred an immunity by a
single attack, but affected the same individual repeat-
edly, what precautions could prevent its propagation and
constant circulation whilst subjects remained to be opera-
ted upon, which would not seem to be the case till
one species was annihilated. An individual would
have scarcely recovered, ere he would be attacked again,
so that there could be no safety, save beyond the sphere
of the contagion, and by what limits, save by the bounda-
ries of the world, could that sphere be circumscribed.
Even with all the obstacles to its progress, what coun-
try has escaped its ravages? It is by insulating the
sick by means of persons who have acquired an insus-
ceptibility that a contagious disease is prevented from
spreading, even amongst the minority who are liable
to it; but in the case of yellow fever, which attacks
the same person repeatedly, there could be none who would
be invulnerable; none who could interpose with safety
and cut off communication by standing like an
impurple barrier between the healthy and the sick.



All would be equally liable to the contagion within 73 the sphere of its influence; the disease would advance in an increased proportion, till, at first, communicated, and next the whole human race would be exterminated. But, happily, no such effects take place. The yellow fever, after having prevailed for a season, will sometimes die gradually away, and finally disappear, or suddenly cease when at the height of its epidemic malignity and prevalence, leaving the great majority of the community untouched and unharmed. As, therefore, effects would take place, if the disease depended on a volatile contagion, which certainly do not take place, the conclusion necessarily follows that yellow fever is not dependent on a volatile contagion. The farther we trace the history of epidemics in all their phenomena, and throughout all their nature, and character, to their minutest peculiarities and their utmost ramifications, the more we shall find them to diverge from the genius and direction of specific contagions.

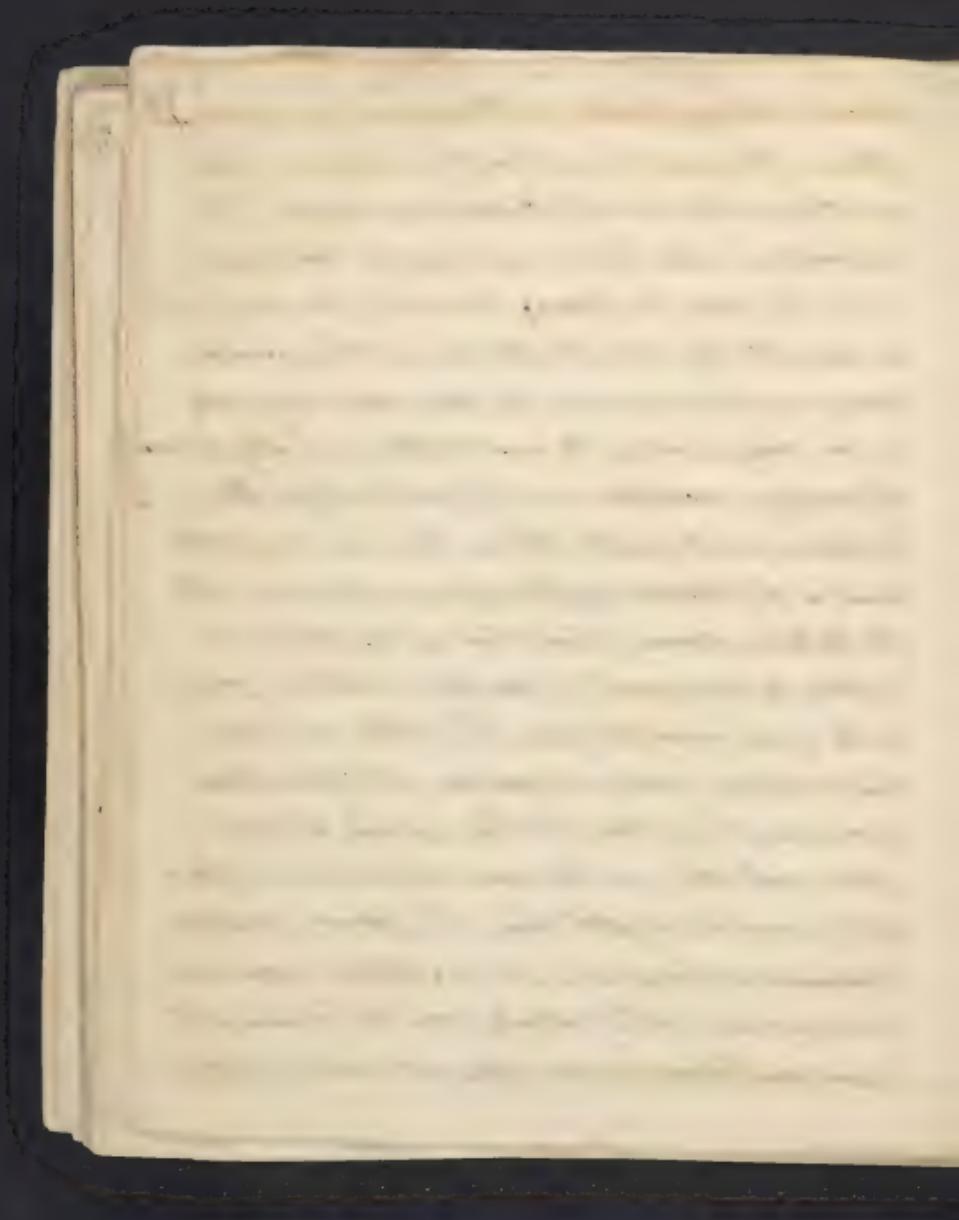
The circumstances of the limitation or confinement of epidemic diseases to particular countries and of their



preference or partiality for certain descriptions of persons,⁷⁴ is, hostile to the doctrine of their capability of communication by contagion. The history of both yellow fever and plague is very remarkable in these respects. The accounts of the almost instinctive propensities of this latter disease are exceedingly curious, and its insuperable likes and dislikes for certain countries and classes of people have been accounted for. Dr MacLean in his interesting narrative of the plague as he saw it at Constantinople has stated the law of susceptibility to its attack, and has referred these varieties to the habits, customs, situations, and in fine to all those circumstances in life which are known to exert a powerful influence on both the bodily and mental energies, and which operate with peculiar force among the mixed and opposite characters of the population in many of the plague cities of the East. The severe abstinence from strengthening food for example during certain seasons, enjoined by certain religions, is one among the many circumstances which vary the liability to plague and is of far more powerful tendency than is probably in general supposed. With the fasting days among the catholics of the

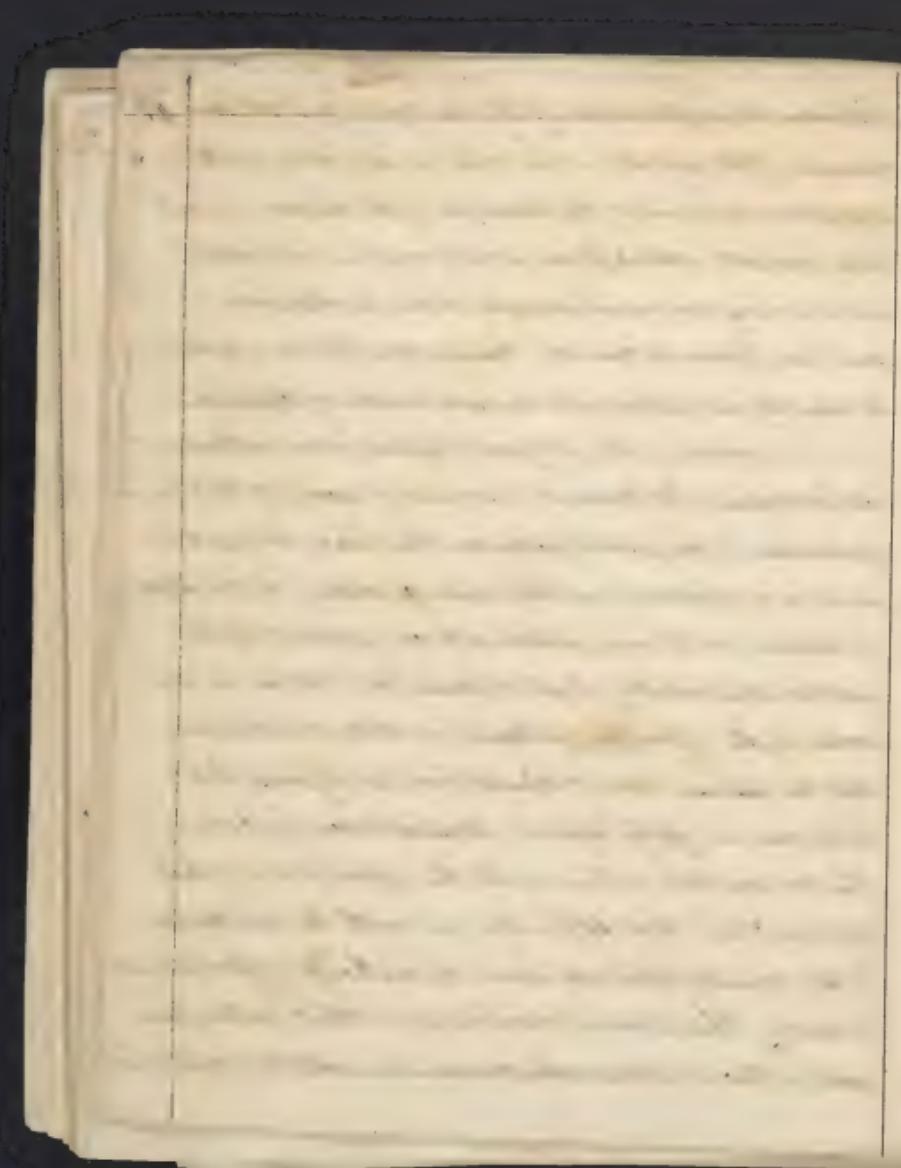


Seven, including Greeks and Armenians, are upwards 75
of 200 in the year, during which they subsist on herbs
or roots and dry bread, the Ramatthan, or Lent of the
Mahometans, lasts but a single month. Besides, we are
told, if the Greeks fast during their Lent from Sun-rise
to Sun-set, they make ample amends for this privation
from sun-set to sun-rise, on these accounts, as well
as from their inhabiting the most elevated and healthy situations
they enjoy an exemption in a far greater degree than
the supine and emaciate Catholics. There are several other
traits in the character of yellow fever, in common with
all epidemic diseases, which stand out as prominent
features to distinguish it from those which are governed
by the rigid rules of contagion. The farther we proceed in
the particular history and nature of the two species
of maladies, the farther will they be found to diverge
from each other, and the more distinctive and evident
the laws which regulate them. The forms of contagious
diseases are always alike; the particular disease can
be pronounced with certainty from the beginning; it
is known before hand how long will be the interval

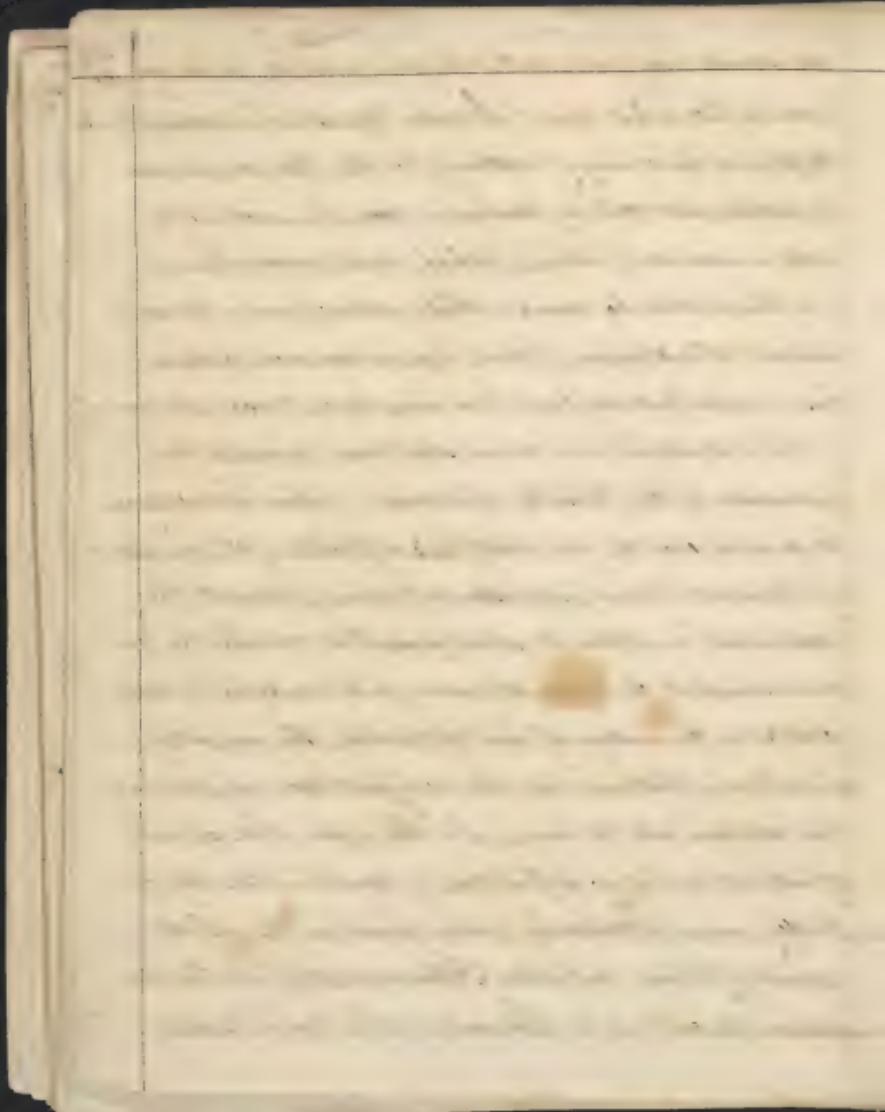


between the application of the contagion and the development of its effects; what will be the order of the symptoms; and what the termination of the disease. In all these respects, yellow fever is very vague, uncertain, and varying, so much so as to throw a character of great multiplicity over the disease, and oftentimes to render its identity in individual cases a matter of suspicion.

Again; the progress of yellow fever outlaws all contagion. Dr. Burnet's account of some of the Spanish epidemics is very satisfactory, on this head. A great number of facts are at hand for quotation, but I shall be satisfied with one, picked out on account of its superior applicability, but because it is told in a few words. Of the Gibraltar epidemic in 1813, it is observed "that the disease did not spread from any focus, but broke out in fifty different places at once" (p. 312) This we are told is true of all the yellow fevers of that city (p. 324) that this is the case with the epidemics of this country also, we have the authority of Dr. Caldwell to testify. He declares (memoir, p. 100) "that yellow fever will in two or three weeks overrun an extent of city which

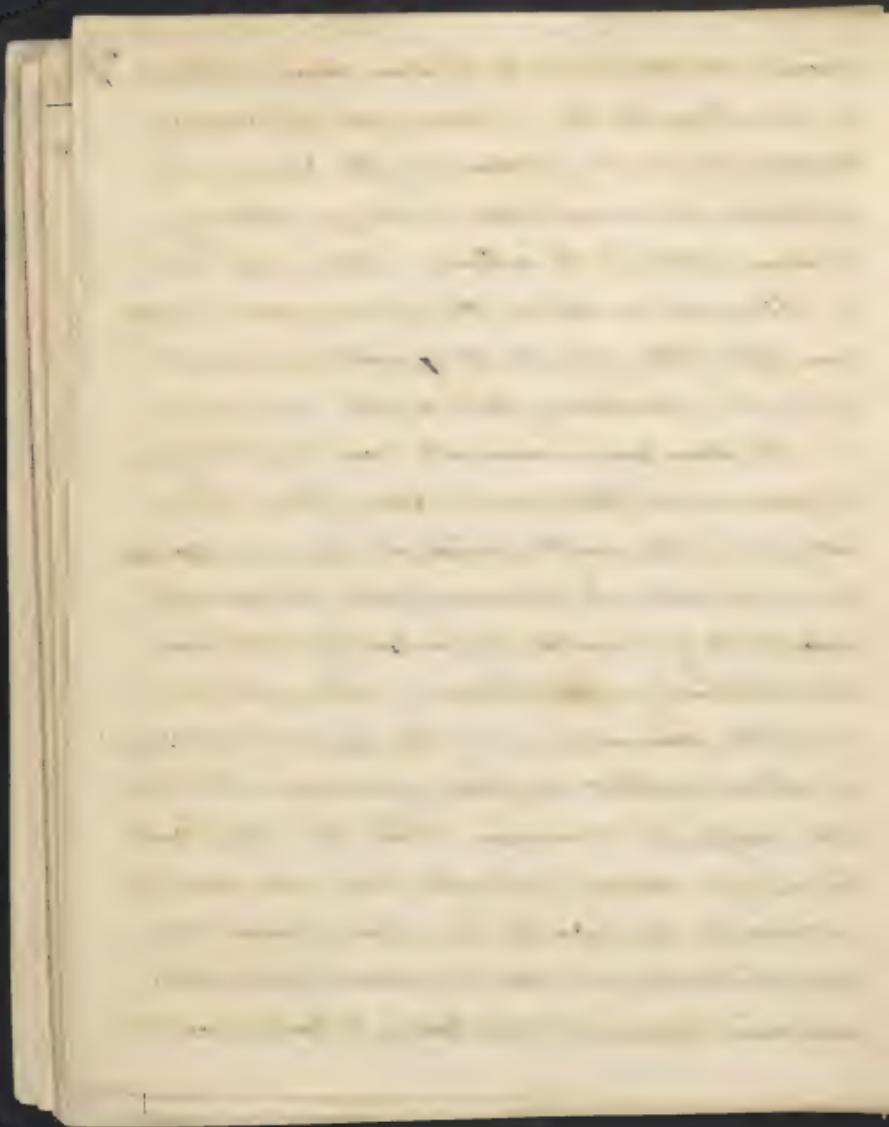


the small pox will not prevail in twice as many 77
months, & to what cause", he asks, "can such a remarkable
difference be owing? Certainly to this, that small pox
is propagated only by contagion from the sick to the
well, a source of disease which most persons have it
in their power to avoid; while yellow fever is spread by
vitiated atmosphere, which, being a common medium,
has access to every one". We have recent examples enough
of the wide spread, and almost electrical rapidity, and
pervasion of this terrible epidemic. Spain has reason
to mourn over the mortality and affliction of the hundreds
of thousands of her population who sank beneath the
pestilential visitations of yellow fever that marked the com-
mencement of the present century and rendered it mem-
orable in the history of her calamities, the reports of
Sir James Fellows on this subject are unfortunately
too copious and too true. In the year 1804, upwards
of 45,000, out of a population of 60,000 in the city of
Cadiz, were attacked by yellow fever in the short
period of three months, (Fellows p. 420) In the same
year, 76 out of 80 thousand of the inhabitants of



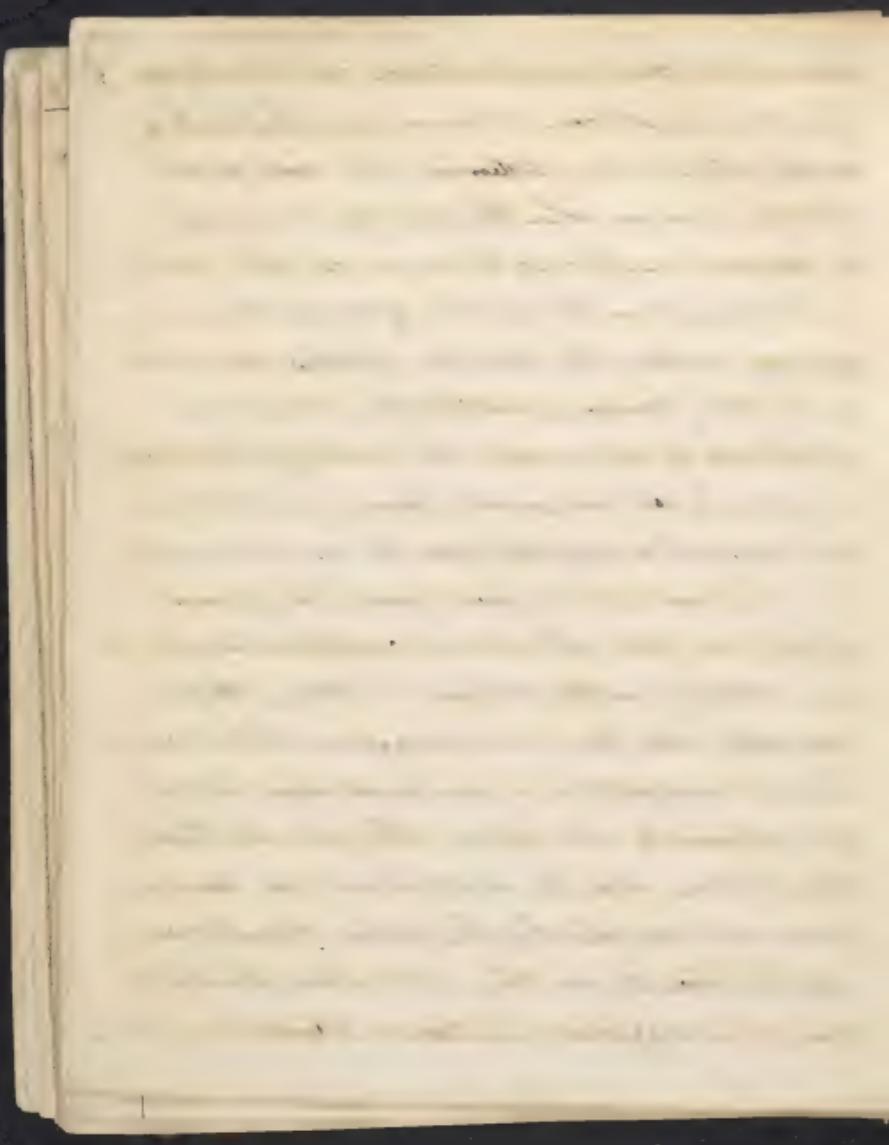
Seville were afflicted with the same disease, whilst, at 78
the same time, the city of Lores suffered the enormous
mortality of upwards of 10,000 out of the 95,000 of her
population (440) Seven thousand of the population of
Malaga perished in the autumn of 1803; (4. 95+) and
a still greater number in the following year. In 1804,
three fifths of the population of Gibraltar were swept
off by yellow fever during four months (pp 75-2449)

The same year is memorable from the yellow fever
epidemic which afflicted 23 of the cities of Spain, the is
computed by Bancroft and Fellowes to have lost 120,000
of her population. In 1813, nearly three thousand of the
inhabitants of Gibraltar were seized by yellow fever,
notwithstanding eight thousand of her people fled the
city at the commencement of the epidemic and escaped
an attack - without lengthening this list, which were
easily sufficient to enquire whether these things could
be true of a disease, propagated from individual to
individual by a contagion which is believed to
radiate but ten feet from the person affected in a
sufficient degree of concentration to communicate



disease? Another query for solution on the contagious 79 hypothesis must occur to every body, what puts a sudden stop to these epidemics; what extinguishes at once a disease, when the quantity of contagion is so abundant, sufficient to overrun the whole world?

It can not be the reduction of temperature or any quality or state of the atmosphere; for these touch not the matter of contagion, and therefore cannot affect its efficiency and powers. We would expect such a cessation in all miasmatic diseases, and accordingly we find such a cessation, under the very circumstances in which we would a priori pronounce it must happen, we would not expect in contagious diseases, and accordingly we do not find it in them. Another proof that yellow fever is not contagious is that it never has been propagated in a pure air or beyond the sphere of the miasmatic atmosphere. This fact is so literally true, that, in cities, the infected districts are sometimes so accurately marked, that the epidemic cannot overleap their boundaries. These positions are admitted by even the Contagionists, the cases in illustration of them



are so numerous, unequivocal, and well defined, as to place the matter beyond suspicion, and render any citation of them superfluous; for why should that be attempted to be proved, which nobody denies; such an attempt would be in the language of Dr Johnson, but to "convince those who had no doubt before."

Were there no other fact than this, on which to found the belief in the non-contagiousness of yellow fever; it would settle the point beyond the possibility of controversy. If a miasmatic air is a *sine qua non* to a disease, that disease cannot be contagious.

Almost all the physicians and surgeons of the British fleets and armies in intertropical latitudes have no belief in the contagion of yellow fever; in the West Indies, the opinion has been long since abandoned not only by medical men, but by the intelligent part of the inhabitants. In the United States, of those physicians who have seen the disease, a very minority, adhere to the doctrine of the last century.

The French Academy of Medicine during the last year, unanimously declared and published their

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incredulity, of those, who have had experience of the disease, the Spanish physicians alone still cling to the doctrine promulgated by the head of their Religion. It belongs to the crew of the nation, is interwoven with their superstition, and enforced by the rigors of the law. Unhappy Spain, is now weighed down beneath the pressure of a brutalizing despotism, is still overshadowed by the gloomy darkness of the middle ages, and has never shared in the reformation in religion or government, which has enlightened and animated many of the other nations of the world. A sombre melancholy is reflected over the intellect of the country in every department of science. A nation several centuries behind its fellows, it would be unreasonable to expect her to keep pace with them in the department of medicine. It must be revolutionized in government before it can advance in literature and science; then we may expect it to reject the doctrine of the contagion of yellow fever, when proscription and banishment shall have ceased to be numbered amongst its frequent consequences.—

